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Biography

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JEROME CARDAN.

THE LIFE

OF

GIROLAMO CARDANO, OF MILAN, PHYSICIAN.

BY HENRY MORLEY,

AUTHOR OF "PALISSY THE POTTER," &c.



IN TWO VOLUMES
VOL. I.

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PREFACE.

JEROME CARDAN, confident of being remembered by posterity, desired that he should be fully known, and left scattered about his writings much material for the biographer. The material so liberally furnished has not yet been used. Encyclopædists have for generations told the student that the life of this philosopher was one of the most curious on record, full of extremes and contradictions, the most wonderful sense and the wildest nonsense. They have adopted the near-sighted views of Gabriel Naudé, have accepted sometimes gross errors of fact from the Scaligers, and, when they have gone to Cardan himself for information, have rarely carried their research farther than the perusal of a work or two. Commonly they have been content with a reading of his book on his

own Life, which is no autobiography, but rather a garrulous disquisition upon himself, written by an old man when his mind was affected by much recent sorrow.

In that work Cardan reckoned that he had published one hundred and thirty-one books, and that he was leaving behind him in manuscript one hundred and eleven. It is only by a steady search among his extant works, and by collecting into a body statements and personal allusions which occur in some of them, assigning to each its due place, and, as far as judgment can be exercised, its due importance, that a complete narrative can be obtained, or a right estimate formed of his Life and Character. Of such collation this work is the result; and, although it is inevitable that there should be errors and omissions in it, since the ground is new, the labour on it has been great, and I am but a feeble workman,—yet, forasmuch as the book is an honest one, in which nothing vital has been held back or wrongly told, except through ignorance, and no pains have been grudged to make the drawback, on account of ignorance, as small as possible, I am not afraid to put my trust in the good-nature of the reader who shall detect some of its omissions and shortcomings.

The following sentences, from the notice of Cardan in Tiraboschi's History of Italian Literature, fairly represent

the common feeling with regard to him:—"Brücker regrets with reason that nobody has written his life with exactitude. . . . . The wide scope of my own argument does not permit me to make any minute researches; I can only say what will be enough to give some notion of this most rare man. In the account that he gives of his own character, he attributes to himself inclinations that it would seem impossible to have co-existing in a single character, and at the same time he speaks so much evil of himself, that by this only one may see how strange a man he was. . . . . Whoever would suppose that a man foolishly lost behind judicial astrology . . . . a man more credulous over dreams than any silly girl, observing them scrupulously in himself and others—a man who believed that he had the friendship of a Demon, who by marvellous signs warned him of perils—a man who himself saw and heard things never heard or seen by any other man—a man, in short, of whom, if we read only certain of his works, we may say that he was the greatest fool who ever lived—who would suppose, I say, that such a man was at the same time one of the profoundest and most fertile geniuses that Italy has produced, and that he made rare and precious discoveries in mathematics and in medicine? Nevertheless, such was Cardan by the con-

fession even of those who speak of him with most contempt."

Of that candour of self-revelation to which allusion is made in the preceding extract, Jerome himself writes: "What if I confess my vices; why marvel; am I not a man? And how much more human is it to acknowledge than dissemble? What we cloak, we protect; what we acknowledge, we confess and avoid. Let, therefore, the most sweet love of truth and the most happy consciousness thereof conquer all dread of infamy, all suspicion of calumny[1]." Elsewhere he says on the same subject—and we must remember that he did not live in cleanly times—"What if any one were to address the kings of the earth, and say to them, 'There is not one of you who does not eat vermin and other worse filth of your servants?' In what spirit would the speech be taken, though most true? What is this but an ignoring of our condition, a determination not to know what we do know, to put a thing out of our sight by force? So it is with our sins, and all else that is filthy, vain, confused, and uncertain in us. Rotten apples fall from the best tree. I tell nothing new; I do but tell the naked truth[2]." Evident enough it is that

[1] Genitalarum Exemplar (ed. 1555), p. 523.

[2] De Vitâ Propriâ, cap. xiii.

Cardan is determined to hide nothing, and it is not less evident that he has been ill-rewarded for his frankness. Over and over again all self-accusations have been accepted and driven home against him, all self-praise has been called vanity, and statements of his that appeared to be too marvellous have been pronounced untrue.

But the man of profound genius sometimes wrote, we are told, as if he were a fool. His folly may instruct us. It belonged—bating some eccentricities—not to himself alone. His age claimed part in it, and bought his books. He was the most successful scientific author of his time; the books of his that were most frequently reprinted being precisely those in which the folly most abounded. He was not only the popular philosopher, but also the fashionable physician of the sixteenth century. Pope and emperor sought him; kings, princes, cardinals, archbishops were among his patients. There were other physicians in those days wise enough to be less credulous on many points, but greater wisdom did not win for them an equal fame. Cardan obtained a splendid reputation wholly by his own exertions, not only because he was a man of power and genius, but because he spent much of his energy upon ideas that, foolish as they now seem, were conceived in the true spirit of his age. He belonged

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completely to his time. Hence it is that, as a philosopher, he almost perished with it; and for the last hundred years his reputation has existed only as a legend.

I was first attracted to the study of Cardan, from which this work has arisen, by the individuality with which his writings are all marked, and the strange story of his life reflected in them. The book is twice as large as it was meant to be, and still there was matter that might have occupied another volume; for as I worked on, I found that out of the neglected writings of this old physician it was possible to re-construct the history of his career, with much minuteness in the kind of detail that would make it not only pleasant reading, but also, if rightly done, of some use to the student of the sixteenth century.

Pains have been taken to confine the narrative within the strictest bounds. There is not in it an incident, however trivial, which has been created or transformed by the imagination of the writer. I have kept rigidly to truth, and, as was necessary from the nature of the work, have, in treating the main subject, referred in notes to the authority for every statement. If here and there a little fact should happen not to be so authenticated, I beg to assure the reader that it was not set down lightly. I have even preserved to a very great extent in my own

writing Cardan's forms of speech. In support of those parts of the book which discuss accessory matters, I have thought it enough to indicate in the notes generally from what sources information has been got, and, in particular cases, to give the exact authority when for any reason it has seemed desirable to do so. Citations from the works of Cardan have been made, as far as possible, from editions published in his lifetime. Of each work, the edition used is stated when it is first named; and the paging quoted afterwards always belongs to the same issue, if no other is mentioned. Where no early copy was to be had, reference has been made to the collected works issued in 1663 at Paris, by Charles Spon, in ten volumes folio.

London, March, 1854.

When the first sheets of this work were printed, I had not seen Cardan's third horoscope of himself in the "Geniturarum Exemplar." I therefore was obliged to conjecture his mother's age, and the paternity of three children, whose deaths are recorded in vol. i. p. 7. It was, at the same time said in a note, that my opinion was insufficiently supported, and that it might be wrong. From the horoscope just mentioned, it appears that Cardan's mother was not quite so young as I had inferred, though there was still great dis-

parity between her age and that of Fazio. If her age at Jerome's birth was, as he says, thirty-seven, the disparity was of nineteen years. He adds, however, that she died on the 26th of July, 1537, at the age of seventy; and if the age so given be accurate, she must have been thirty-four years old when he was born, and twenty-two years younger than Fazio. She was the widow of Antonio Alberio; and of her three children that died of plague soon after Jerome's birth, Alberio was the father. They all died within forty days; two of them, within a week after their mother dreamt that they had gone to heaven. On the same authority, it may be added that Fazio and Clara had another child, a son, which died at birth.

A remark upon a trivial point is suggested by the word Clara that has just been used. There are few people mentioned in this narrative whose names would not admit of being written in more ways than one. I have had to make my choice in nomenclature among Latin forms, Latin Italianised, old or impure Italian, modern Italian, and Italian Englished. In speaking of men not Italians there was often a like difficulty. Very much wishing to avoid pedantry, and putting that wish foremost, I have endeavoured to use in each case a form that would suit the temper of the book without vexing the reader.

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JEROMĖ CARDAN.

CHAPTER I.

BORN TO SORROW.

In the year 1501[1], a woman, flying from the plague, passed under the gate of Milan which leads out upon the road to Pavia[2]. She was a young widow[3], the daughter of a studious man, Giacomo Micheria[4], and she turned her back not only on the plague, but also on a grave

[1] De Consolatione, Lib. iii. (ed. Ven. 1542) p. 74. In the De Propriâ Vitâ Liber (ed. ex Bibl. Gab. Naudæi, Paris. 1643), cap. ii. p. 7, he writes the date 1500 by misprint. The misprint has been sometimes followed, though facts stated in the same book (as is shown by Bayle, who had read no other) correct it, and in every other place in his works Cardan writes 1501. See especially the date and hour of his birth given by him in his horoscope (Libelli V. De Supplemento Almanach. &c. ed. Norimberg. 1547, p. 121), where they are stated to be the 24th Sept. 1501, at forty minutes past six in the afternoon. Except the misprint, this coincides with his other statements on the subject. See also De Utilitate ex Adversis Capiendâ (ed. Basil. 1561), Lib. iii. p. 427.

[2] De Libris Propriis eorumque Usu. Liber ultimus. Opera curâ Spon. Vol. i. p. 96.

[3] Compare notes 1, p. 2, and 1, p. 6.

[4] De Propr. Vit. Lib. (ed. cit.) cap. i. p. 6.

jurisconsult and mathematician, who was, at that time, probably as much an object of aversion to her as the plague itself—his name was Fazio Cardan[1].

Fazio Cardan was a man of note among the learned in his neighbourhood, and was then fifty-six years of age[2]. At the age of fifty-six he had already become toothless, although strong of limb and ruddy of complexion. He had good eyes; not in the sense of being beautiful, for they were white, but in the sense of being useful; for it was said that he could see with them in the night time. To his last days—to the age of eighty—Fazio Cardan continued to see objects clearly with the aid of less light than his neighbours needed, and required no spectacles. As a doctor, both in law and medicine, and member of the venerable college of men skilled in law, the white-eyed, toothless, stuttering, and round-shouldered mathematician clothed his healthy body in a purple robe. He wore a black skull-cap, which he dared only remove for a few minutes at a time, because his skull had suffered

[1] ". . . natus essem Papiæ, grassante in urbe nostrâ peste, tum etiam quòd mater partum ipsum occultari volebat, nec illius affines resciscerent. Pater enim meus, ut Senex ac Jurisconsultus, viduæ Matris meæ pauperis *publicas* nuptias aversabatur: ipsa vero turpe ducebat, quòd *diceretur* non ex conjuge peperisse." De Libris Propriis. Liber ultimus. Opera curâ Spon. Vol. i. p. 96. Cardan never defames his mother.

[2] He was born at twenty minutes to nine in the morning of the 16th of July, 1445. See the date in his horoscope, Libelli V. De Suppl. Almanach. &c. (ed. cit.) p. 106.

damage in his youth, and it had been found necessary to remove some pieces of it. The skull may have been broken in a fray, for Fazio Cardan was always hot of temper[1]. There was also a quick spirit of humour in him, but it was not genial; he was careless of money, and a ready lender, but he made few friends[2]. He dwelt with Euclid in a world of angles and right-angles, and he himself was angular; nevertheless, his heart had rounded itself to the love of one man, very different in taste, Galeazzo Rosso[3]. As a student, also, he delighted in the ingenuity of Gianangelo Salvatico[3], his pupil and house-companion. Rosso, who was a smith, equalled the jurisconsult in a decided taste for mathematics, and delighted him by the ingenuity with which he turned his knowledge to good practical account

The knowledge of Fazio, at the same time, had not remained idle. In the prime of life he had been deliberately drawn into print by the booksellers of Milan, who desired to publish something profitable to the learned, and applied to Fazio Cardan as a man likely to produce for them

[1] De Propriâ Vitâ (ed. cit.), cap. III. p. 10, for the preceding details

[2] De Utilitate ex Adv. Capiend. (ed. Basil. 1561) Lib. III. pp. 428—430.

[3] De Propr. Vit cap. liv p. 11. Galeazzo was by trade a smith. Op cit cap xv. p. 71. Salvatico a senator. The smith was an ingenious man, who discovered for himself the screw of Archimedes before the works of that philosopher had been put into print. He made also remarkably well-tempered swords and shot-proof breastplates. De Prop. Vit. p. 11.

judicious matter[1] He resolved then to edit a work, at that time, I think, known only in manuscript, treating of rays of light, and of the eye, of reflection, and of allied topics, in the form of propositions proved by the aid of geometrical diagrams, of which the original author was John Peckham, Archbishop of Canterbury. This book, which really deserved promulgation—Peckham's *Perspectiva Communis*[2]—Fazio took upon himself, as he tells us in the dedication to his own edition, the great labour of correcting, a work heavy enough for a learned man, most heavy therefore for him. It was an arduous undertaking, he said, calling for great knowledge of mathematics pre-

[1] "Prospectiva Communis d Johannes Archiepiscopi Cantuariensis . . . ad unguem castigata per . Facium Cardanum" Milan, 1480, p 1 in the dedication It begins thus "In tanta laborum cujuscunque generis copia, divino quodam imprimendi artificio comparata, appetentes hujus urbis impressores novi quidquam in medium afferre quod esset studiosis non mediocriter profuturum persuasique mea opera id effici posse me illud efflagitantes convenerunt"

[2] John Peckham, Archbishop of Canterbury, born 1240, became a minorite friar, and rose through sundry grades of Church preferment to his crowning dignity He bought it of the Pope for 4000 marks, which afterwards he risked excommunication by not paying, or by paying slowly He was a man of taste, luxurious, accomplished in the learning of the age, and liberal to all but Jews. The Jews he persecuted He died in 1292, and was buried in Canterbury Cathedral He left many works which still exist in MS. Only two have profited by the discovery of printing, namely, his Collectanea Bibliorum, and his Perspectiva Communis The last is interesting as the first systematic work of the kind, and I find no trace of its having passed out of MS into print before it was published, with additions and corrections, by Fazio Cardan. After that date it was re-issued frequently by other editors—at Leipsic in 1504, at Venice in 1505, and afterwards at Nuremberg, and Paris, and Cologne.

paratory to the correction of the original figures and the amendment of the text. He knew, however, that a work so difficult would at no time be undertaken; not for want of men learned enough—Heaven forbid that he should be so arrogant as to suppose it!—but for the trouble's sake, the work, though useful, would remain undone. Therefore he, Fazio Cardan, had done it. On the threshold of his task, however, since he had great need of a patron's countenance, he committed his book to one who was as grave as Camillus, as dexterous as Scipio, and so on[1]. That was the book, and that was the manner of dedication to the book published by "the excellent doctor in the arts as well of medicine as law, and most experienced mathematician, Fazio Cardano, of Milan, residing in the venerable college of the Milanese jurisconsults." This offspring of the mind of Fazio was about twenty years old[2] when Chiara Micheria, flying for refuge from the plague to Pavia[3], took with her offspring of another kind, to which he also was the father, a child yet unborn.

Whatever pains Fazio had taken to protect his literary bantling against any risk of dropping dead into the world, the care that preceded the birth of his true child was

[1] Op. cit. In dedication.

[2] Its date of 1480 is assigned on the authority of Burnet. The copy in the British Museum has no title-page.

[3] De Libr. Propr. Ed. ultima. Opera curâ Spon. Vol. i. p. 96.

bestowed in a precisely opposite direction. Chiara (Clara) Micheria was still very young[1], passionate of temper[2], and had quitted Milan in the worst of humours. Medicine refused, however, at her bidding—or rather at the bidding of her bad advisers[3]—to fulfil an evil purpose; and at Pavia, on the 24th of September[4], in the year 1501, the living child of Fazio Cardan was brought, after a three days' labour[5], through much trouble[6], silently to light. Considering that it was very nearly dead, the nurse promptly immersed the infant in a little bath of wine[5]. It had already a growth of long dark hair upon its head[5], and it very soon gave evidence of life and strength. That it would not die very soon there was great reason, the mother knew, to hope or fear, since it is certain that longevity becomes often inherited, and she herself—a short, fat, healthy woman, of a lively wit[2]—as well as the geometrician, came of long-lived ancestors[7].

Let me dwell for a few minutes on this question of the

[1] "Matrem meam Claram Micheriam juvenem vidi, cum admodum puer essem." De Consolatione (ed. Ven. 1542), Lib. ii. p. 41.

[2] De Propr. Vit. Lib. p. 11.

[3] "Medicamentum abortivum Alieno mandato bibit." De Ut. ex Adv. Cap. (ed. 1561) Lib. iii. p. 427.

[4] See Note 1 on page 1.

[5] De Ut. ex Adv. Cap. p. 427.

[6] "Per vim extractus ut meo supplicio matrem liberarem a morte." De Ut. ex Adv. Cap. p. 427.

[7] "Longævi autem fuere majores nostri." De Propr. Vit. cap. iv. pp. 5, 6, for the succeeding details.

infant's probable longevity. The father of Clara lived seventy-five years, and his brother, Angiolo, lived eighty-five. In the Cardans, the habitual tenacity of life was most remarkable. The grandfather of Fazio, the mathematician, was another Fazio; he had three sons: Giovanni, who lived to the age of ninety-four; Aldo, who lived eighty-eight years; and Antonio, the father of the second Fazio, who lived to the age of eighty-six. Giovanni, the first of these, uncle to Fazio the scholar, had two sons, Antonio and Angiolo, of which the former lived to the age of eighty-eight, and the latter very nearly reached a hundred. This Angiolo became known to the young son of Fazio as a decrepid old man, who, at the age of eighty, claimed paternity of two decrepid-looking children, and regained his sight. Even of these children one lived seventy years. To this enumeration must be added Gothardo, a brother to the second Fazio Cardan, and uncle of the child, who died eventually at the age of eighty-four. Since several of these men were living in the year 1501, Clara Micheria could take into her calculation a part only of these facts; there was enough, however, in her knowledge to remind her that the unwelcome son came of a long-lived stock, and that if he was to be accounted a discredit, he would probably discredit her for many years to come.

During the first month of the boy's life his nurse was

seized by the plague, and died under its touch in a few hours[1]. The infant did not pass unscathed, for there appeared at the same time five carbuncles on its face; one on the nose, the other four arranged around it in the pattern of a cross. Although healing in a short time, it was observed that three years afterwards these carbuncles appeared again in the same places[2]. Deprived of his nurse, and little aided by his mother, the son of Fazio Cardan was received into the house of Isidoro dei Resti[3], a noble gentleman, his father's friend. At that time the geometer was burying in Milan all his other children dead of plague. They were two boys and a girl, half-brothers and half-sister to Clara's child[4]. In the house of Isidoro, the survivor says, speaking of the past out of his after-life, and tincturing his words with the bitterness of many griefs, "After a few days I fell sick of a dropsy and flux of the liver, yet nevertheless was pre-

[1] De Propr. Vit. cap. iv. p. 12.

[2] The page last cited and De Ut. ex Adv. Cap. p. 427.

[3] De Propr. Vit. p. 13. De Ut. ex Adv. Cap. p. 427.

[4] De Consolatione (ed. Ven. 1542), p. 74. Their names were Thomas, Ambrose, and Catilina. De Ut. ex Adv. Cap. p. 427. The passage in the De Consolatione, "jam trimestris duos fratres et unam sororem perdidi: crassante in civitate nostra pestilentia . . . tunc audaci et pio facto Is. Restæ nobilis viri et amici paterni, manibus ejus inter funera exceptus . . ." is my only textual authority for attributing these children to Fazio. It is indecisive, and I may be wrong. They may have been children left as consolations to the widow. If so, Clara must have married very early. Had they belonged equally to Fazio and Clara, one does not see why in the case of Jerome his mother

served, whether through the wrath or mercy of God I know not[1]."

Thus environed by the plague-spots, physical and moral, which belong to an unwholesome period of human history, began the life of which we are about to trace the current. Out of the peace of our own homes let us look back with pity on the child whose birth made no man happy, and whose first gaze into the world was darkened by a mother's frown.

should have endeavoured to keep a knowledge of his birth from her relations, or why she should, in expectation of a fourth child, desire abortion, and resent the fact that Fazio was not known to the public as her husband. (See note I, p. 2.) Besides, if her relations with Fazio were thus of some years' standing, how old was her widowhood? and could she still be "juvenis" when Jerome was a boy old enough to be told of her unhappiness, and of her wish (De Consolatione, p. 41) that she had died when he was born?

[1] De Consolatione (ed. Ven. 1542), Lib. iii. p. 74.

CHAPTER II.

IN WHAT WAY THE CHILD EARNED A MOST HOLY AND MOST HAPPY GODFATHER.

AFTER the death of its first nurse by plague, Clara Micheria had returned for a short time to her infant[1], but a new mother having been hired for it, she again obtained exemption from her burden. The nurse, who in the second month of the child's life became the third to whom it clung as to a mother, did not accept her charge without due knowledge of the fact that it had been kissed by the very plague itself, and bore the marks upon its countenance. To the new nurse, therefore, the baby was delivered by Isidoro dei Resti, naked and wet, out of a warm bath of vinegar. With clothes, infection might have gone into the poor woman's family—so men, at any rate, believed—the clothes, therefore, were burnt; vinegar, it was hoped, would disinfect the child.

By this nurse the child was taken to Moirago, a place distant about seven miles from Milan, on the road from Pavia to Binasco. The infant did not thrive under her

[1] De Propr. Vit. Lib. (ed. Naudæi), pp. 12, 13, for the facts stated in this and the succeeding page.

care. It may have carried with it some seeds of disease; it most probably found little that was wholesome in the squalid hut to which it was removed; perhaps, as they who paid for the child said, the woman herself was not competent to play the part of mother in a wholesome way[1]. Certainly, the little body wasted, and acquired the hard and swollen belly, which at that time in Italy, as it is now in England, was too well known to the sight and touch of men, who in vain sought to supply with drugs the want of healthy homes among the poor. Though the child was not loved, there existed in the mind of nobody a criminal desire that it should die; and since, therefore, it wasted at the breast of its third mother, a fourth was hired, under whose care its health improved. With this nurse the boy remained—still at Moirago—and by her he was weaned in the third year of his life. In the next year, Clara Micheria claimed him at last, and took the son, who had learned to prattle at the knees of strangers, home to her own sad lodging in Milan. The doubtful character of Fazio's relation to her—she a girlish widow, he a toothless old geometer, aged sixty—filled her life with shame and sorrow, and a frequent theme of her discourse to the child was a desire that she had died when he was born[2].

[1] "Quòd nutrix utero gereret." De Propr. Vit. p. 13.

[2] De Consolatione, p. 41.

Clara Micheria was not at that time resident under the roof of Fazio Cardan[1]. The laudatory verses sung in honour of the literary offspring of the grave jurisconsult, had ended with a distich in his praise, of which the literal translation is, that "in this man the house of Cardan rejoices. One man has acquired a knowledge of everything. Our age has not his equal[2]." Probably this man, who had learned everything, was not, in the year 1505, acquainted with the voice of his own child, that had been four years in the world and never sat upon his knee. The rejoicing of the house of Cardan was not great in the person of the little fellow who, after his removal to Milan, was perpetually beaten by his mother and her sister, Margherita, who dwelt with her: "A woman," he says afterwards, "who I believe must have been herself without a skin," so little was her mercy for the skin of Clara's child[3].

The hands of three persons at Milan were against the child, for Fazio Cardan, though not residing in one house with Clara, now came into habitual communication with

[1] De Propr. Vit. p. 13. Statements in this and the next page to which no note is attached are dependent on the same authority.

[2] "Magna ratis magno curanda est remige. Deerat
Navita. Nunc Facius talia damna levet.
Hoc Cardana viro gaudet Domus. Omnia novit
Unus. Habent nullum secula nostra parem."
Prospectiva Comm. d. Joh. Archiep. Cant. per
Fac. Cardan. Milan. 1480. Last page.

[3] "Mulier cui fel defluisse existimo." De Propr. Vit. p. 13.

him, and administered a due share of the prickliest paternal discipline. The ill-treatment of the neglected boy was not, however, constant—though the hands of his father and mother were against him, their hearts were with him—he was, on the whole, treated less unkindly than before. His parents had ill-regulated tempers, and the child became the victim of the passions out of which he was unluckily begotten[1]. Flagellation from his father and his mother, and his pitiless aunt, Margherita, impressed upon his memory three miserable years after his first arrival at Milan. At the end of those years, when his age was seven, and he had often been brought even to the point of death by the results of too incessant punishment, a respite followed. Father, mother, and Aunt Margaret perceived that the weak child, who had up to this time been suffering from a long series of bodily distempers, could be knocked about no longer without certain danger to his life; and so it happened, as the boy himself expressed it afterwards, that when he became old enough to do things by which he could fairly merit blows, it was found requisite to leave off beating him.

In that after-life, to which allusion has been made just now, I ought to say at once, that the son is never to be

[1] "Ambobus parentibus commune fuit iracundus esse, parum constanter etiam in amore filii." De Propr. Vit. p. 11.

[2] "Tum primum cum meritò possem verberibus dignus haberi, a verberibus abstinendum decreverunt." De Propr. Vit. p. 13.

found referring with unfilial bitterness to either of his parents. He always avoids making any express statement that would reflect positive dishonour on his mother[1]; and both of her and of his father he speaks often with a reverent affection[2]. He speaks more frequently, however, of his father, whom he certainly preferred, although he does not venture much beyond the remark made in an irresolute way on one occasion, that "my father appeared to me (if such a thing may be said) better and more loving than my mother[3]."

There was a rest then from blows for the sick child when he had attained his seventh year, but sorrow only laid aside one shape to reappear and vex him in another[4]. When the boy had first been brought to Milan, he had lodged with his aunt and mother in the Via dell' Arena[5], by the Pavian gate, and they had afterwards removed

[1] See a curious example in page 2, note 1. He evades there and everywhere the direct statement that his mother was married, but in that passage leads up to the inference that she had been married privately. In the same spirit he says, when he relates his exclusion from the College of Physicians on the ground of illegitimacy, that he was rejected "suspicione obortâ quod (tam male a patre tractatus) spurius essem." De Consolatione, Lib. iii. p. 75. That his tenderness was not towards himself is shown by the whole tenor of his life. He would, for himself, rather have taken a perverse pleasure in the proclamation of a fact that rubbed respectability against the grain.

[2] See especially De Util. ex Adv. Cap. Lib. iii. p. 430.

[3] De Propr. Vit. p. 12.

[4] "Mala sors minime me deseruit, infortunium commutavit non sustulit." De Propr. Vit. p. 13.

[5] De Propr. Vit. cap. xxiv. p. 92.

into a street called Del Maino, opposite the citadel, where they were in the house of Lazzaro Soncino[1], a physician. A physician was a very fitting landlord for the boy, at any rate; and it may possibly have been to the representations of Lazzaro Soncino that the child was indebted for the resolve taken by his friends that he was to be flogged no longer. Very soon after this resolve was taken, a great change took place in the arrangements that existed among the high powers that presided over the boy's worldly destiny. Clara Micheria, with Margaret, her sister, removed to a lodging in the Via dei Rovelli, which they shared with Fazio Cardan[2]. Some semblance of a home, as childhood is accustomed to interpret home, was now, for the first time, placed within the knowledge of the young pupil of sorrow. Father and mother dwelt under one roof with him; the home meant little more. It was no place of laughter, or caresses, or of childish sport. Fazio needed an attendant who should walk about with him while he was engaged upon his daily business, carrying his books and papers, or whatever else the learned lawyer needed to take with him when he went abroad. To this work—the work of a servant—Clara's child was put without delay[3]. Margaret and Clara being

[1] De Propr. Vit. cap. xxiv. p. 92.

[2] De Propr. Vit. p. 13, comp. with p. 92.

[3] "Inde" (ab octavo) "*loco servi* patrem ad decimum nonum annum perpetuo comitabar." De Consolatione (ed. Ven. 1542), Lib. iii. p. 74.

settled, to their satisfaction doubtless, in the lodging of the great mathematician and jurisconsult, the fragile boy of seven years old was ordered daily to attend upon his father when he went abroad; so young and weak of body, taken from a life of close confinement to be put to work that involved severe and constant bodily exertion[1]. With weary limbs and throbbing head, the little fellow daily toiled after his father, revolving in his mind such thoughts as suffering and sickness teach to children who have been trained in no school but theirs.

The boy—I am compelled to speak of him as boy, or child, or little fellow, because, though he had now lived in the world for seven years, it does not appear that he had yet been christened—the boy was contemplative[2]. Minds that are born rich, that possess a soil originally fertile, gain very often by the griefs of a tormented childhood; these increase for after-seasons the producing power—they are as the torments of the plough. It is not so with the barren-minded who are born to sorrow and neglect; what little growth there is in them the plough uproots, and there is only a dry life year by year until the end. The

Yet how delicately he seeks often to veil the recollection of his father's harshness! As, for example, when he refers to it thus: "Ex hoc in paternam, *ut tunc rebar*, servitutem duram transii." De Ut. ex Adv. Capiend. Lib. iii. p. 428.

[1] De Propr. Vitâ Liber, p. 13.

[2] "Cæpi quam primum cogitare an via esset aliqua ut immortales evaderemus." De Libris Propriis. Liber ultimus. Opera curâ Spon. Vol. i. p. 96.

child of Fazio Cardan inherited much innate power: from his father, aptitude for exact learning; from his mother, much vivacity of wit. During these years of early hardship, though he sickened and suffered, he was forced into communion with his own mind by the want of sympathy abroad, and a development was taking place that was not indeed healthy, but that had such charms in it as might have been attractive even to the intellect of Fazio, if the mathematician could have known how to work out the problem that was offered to him in the spirit of his child. He did not work it out; and so, during the summer days, under a southern sky, the boy struggled unnoticed behind his father through the hot streets of Milan.

Intellect at seven years old rarely suggests to any child that fruit should not be eaten until it is ripe; and when the child has a disordered stomach it will fasten upon green things with the relish of a caterpillar. In the midst of his fatigue and sickness, when his body was quite ready for another outbreak of disease, the son, or foot-page, of the learned Fazio Cardan, then commencing his eighth year, at a time when an epidemic, if not pestilence, was raging in the town, ate secretly a great feast of sour grapes[1]. They supplied the one thing that was needed to produce an outbreak of the fever that had long been waiting for some slight exciting cause. Dysentery and

[1] De Propr. Vitâ, p. 14.

fever seized the child, and between them they were killing it[1]. The old geometer—he was then sixty-four years old—had learned to feel that there was something to be valued in his boy, therefore both physic and divinity were summoned to his aid. Two physicians, Barnabo della Croce and Angelo Gira[1], and one saint, St. Jerome, were called into request. The old man was accustomed to assert that he enjoyed a favour which had been conferred on Socrates and others in being benefited by the society and advice of a familiar demon[2]. He did not apply, however, to the demon for a prescription in his son's case, but more piously devoted him to the most holy and most happy St. Jerome, whom he elected to be his godfather and his tutelary saint, upon condition that St. Jerome, by his intercession, would procure the boy's return to health[1]. Why Fazio chose Jerome for his saint it is not possible to tell; but it happened that he was lodging in the house of one Ermenulfo[3], who had Girolamo for his own baptismal name, and I am inclined to think that Ermenulfo—as men in our day recommend to one another their own tea-dealers or tailors—recommended to the lodgers his own patron saint. The boy recovered, and the father,

[1] De Propr. Vitâ, p. 14.

[2] He said it had attended him for thirty-eight years. De Ut. ex Adv. Cap. p. 428. De Propr. Vit. p. 14.

[3] De Propr. Vit. cap. xxiv. p. 92. There may be something to the purpose in the fact, that there was a large religious house dedicated to St. Jerome situated between the Pavian and Vercelline gates.

faithful to his promise, caused him to receive the name of Girolamo, or Jerome[1]. This took place in the eighth year of the boy's life. Up to my eighth year, says Cardan, I had often beaten at the gates of death, but those within refused to open to me[2]. He was newly risen from his bed in May of the year 1509. In the same year, on the 14th of the same month, the French gained a victory over the Venetians near the Adda. Jerome Cardan remembered afterwards that he was recovering from that most serious attack when the French celebrated their triumph at Milan for the battle of the Adda, and that he was then permitted to go to the window and look out upon the spectacle.

Thin, pale, and very thoughtful, little Jerome leaned against the open window, and from the gloom of his own chamber looked down on the helmets, swords, and banners of the military pageant, glittering along the street under the light of the May sun. While the noise of military music and the tramping of the horses shook the whole house in which they lived, how little did it come into the thoughts of Fazio Cardan, Aunt Margaret, or Clara, that the glitter and the bustle of the triumph out of

[1] De Propr. Vit. p. 14.

[2] De Util. ex Adversis Capiend. pp. 427, 428. The summary there given is touching: "Inde lac prægnantis hausi, per varios nutrices lactatus ac jactatus, hydrope, febribus, aliisque morbis conflictatus sum, donec sub fine octavi anni ex dysenteriâ ac febre usque ad mortis limina perveni; pulsavi ostium, sed non aperuere qui intro erant."

doors were but a parade of folly; that the recovery of health by their weak boy would interest posterity much more than anything that had been done or would be done by the strong army out of doors. For war, that can be noble, was in those days altogether witless, and the pen-work even of the worst dunce among philosophers could scarcely fail to display more sense than the sword-work of the cleverest among the captains.

CHAPTER III.

CHILDHOOD AND YOUTH ARE VANITY.

MARGARET of Austria: daughter of Maximilian; sister of the Archduke Philip; aunt of Charles, then Duke of Luxembourg, afterwards Emperor Charles V; governor, for her nephew, of the Netherlands; widow of Jean of Castille the son of Ferdinand; widow also of Philibert of Savoy: acting on behalf of Maximilian and Ferdinand, had at Cambray concluded a league with the Cardinal d'Amboise, who acted on behalf of the Pope and of the King of France. By this league it was agreed to enlarge the borders of the French king's Milanese territory, by cutting off and appropriating the borders of the territory of the too prosperous Venetian republic. In the year 1509 the head of the Church began the enterprise by issuing monitions which bestowed the coveted lands on the first neighbour who seized them. Louis XII, King of France, entered Italy with thirty thousand men, and was allowed to cross the river Adda by which his Milanese duchy was parted from Venetian ground. On the other

side a battle was soon fought near a village called Agnadol, the Venetians were routed, and without more contest driven into Venice. The campaign, therefore, was soon ended. This was the victory of the Adda celebrated by a triumphal entry into Milan in the eighth year of Jerome Cardan's life.

Louis XII, predecessor of King Francis I. of France, was a monarch of whom it is just to speak respectfully. He sought the welfare of his people. When, on the occasion of this brief Venetian campaign, he found his warfare so soon ended that he should not need the special taxes he had levied, he remitted them, and left the money in the pockets of his subjects. He detested all the arts which darkened counsel by a multitude of words, and expressed frequently so great an aversion to the sight of a lawyer's bag[1], that had the little Jerome, when he saw the king pass by under his window, known of the existence of that strong point in his character, he would have spent some part of his recovered health in lusty cheering. Who had so full a right as little Jerome to cheer kings who hated lawyers' bags?

The great delicacy of health which followed the child's illness procured for him exemption from the task of carry-

[1] "Rien n'offense plus ma vue que la rencontre d'un procureur charge de ses sacs." Words of Louis XII, quoted by Anquetil from Claude Seyssel, Bishop of Marseilles, a subject who was much in the king's company.

ing the bag of Fazio, and from all serious labour for a time[1]. During this period of convalescence, when he was living in the street Dei Maini, the weak boy fell from a ladder with a hammer in his hand, and was taken up with a serious wound, in which the bone was injured at the upper part of his forehead, on the left side[2]. The scar left by the wound remained visible throughout the whole of his after-life[3]. He had recovered from this blow, when one day, as he was sitting on the threshold of his father's door, a tile fell from the roof of a high adjoining house, and wounded him on the top of his head, again on the left side[3]. When Jerome was in tolerable health, his father fagged him; when sickness gave him liberty to idle, these accidents disturbed his rest. He had no breast at home that he could lay his head upon in perfect peace; he saw passions at work about him, or felt them at work upon him from the first, chafing his fresh heart, and checking the free outward current of his thoughts. His wit was of the quickest, and his nature sensitive; he felt every slight, and soon began to brood over the wrongs he suffered, to preserve in stillness his own thoughts of impatience at injustice, and acquired that unwholesome self-consciousness that is too often forced into the minds of clever children, not only by too much praise, but also by unjust neglect.

[1] De Propr. Vit. p. 14.
[2] De Util. ex Adv. Capiend. p. 428. De Propr. Vit. pp. 14, 15.
[3] De Propr. Vitâ Liber, p. 15.

He who was mocked so often, he would beat through the bands they tied about his heart, he would do some great thing that should command the homage due to his nature, not the less because he was a child. At the beginning of Jerome's tenth year[1], his father moved to another house in the same street, which he occupied for three years, and during those three years Jerome again carried the lawyer's bag, Fazio insisting upon the use of the child's service with great pertinacity, the mother and the aunt consenting[1].

The position of young Jerome was, however, about this time improved; his father had certainly grown kinder[1], warmed very probably towards him by the signs of intellect that he exhibited, and by the readiness with which he picked up information, even about the geometrician's darling studies[2]. There came also two nephews of Fazio, one after the other, who shared Jerome's labour, either serving in his place, or lightening his work, so that sometimes he was not called upon to go abroad at all, or, if he went, he would not have so much to do[1]. Then there were other changes of abode[1]; first to the Via dei Cusani, and afterwards, until the completion of his sixteenth year, Jerome lived with his father in the house of a relation, Alessandro Cardan.

[1] De Propr. Vitâ Liber, p. 15.
[2] De Ut. ex Adv. Capiend. Lib. iii. p. 429.

It was at the time when, as Jerome tells us, the first down was coming on his chin[1], that the premature death of a young relative, Nicolo Cardan, gave a fixed object to the tumult of his thoughts. Nicolo died at the age of thirty[2], and his place knew him no more. The young philosopher began, therefore, to reflect upon the shortness of life, and to inquire by what means he might be able to provide something worthy to be remembered by posterity; it pained him to think that, after a life spent without pleasure in the flesh, he should go down into the grave and be forgotten[3]. When he had recovered from the terror into which he had been thrown by witnessing the young man's death, he occupied himself in the writing of a treatise On the Earning of Immortality[3].

The sense of power, without which no genius can bear fruit, was rooted firmly in Cardan. The slights and sorrows that had made the outer world in childhood and in youth seem vanity, had driven him to contemplation of that inner world from which there was no pleasant voice to call his thoughts. Self-contemplation, constantly provoked and never checked, acquired a feverish intensity. After the death of his friend Nicolo, when Jerome, with warm passions, found himself at home but half a son, and

[1] "Cum adhuc ephebus essem." De Sapientia Libri V. &c. &c. (ed. Norimb. 1543) p. 420.

[2] De Libris Propriis (ed. Lugd. 1557), p. 10.

out of doors regarded as a questionable comrade[1], a young man with no lawful parents and no prospects, hearing his mother reproached coarsely for his birth[2], holding the position of a servant, with no visible means of escape from it, we feel that there is something touching in the pride of loneliness on which his heart depended for its solace: "As much as it was permitted me," he tells us afterwards, "I lived to myself; and, in some hope of future things, despised the present[3]."

Jerome had been instructed by his father[4] in reading, writing, and arithmetic, in geometry, in some astrology, and had learnt also in the same company to chatter Latin; but he was nineteen years old[5] before Fazio consented to his earnest wish that he might study thoroughly that language—then the only tongue used by the learned—and endeavour to make use of his abilities. The taste for mathematics communicated to him by his father, Cardan always retained. When in his fresh youth he became eager to obtain a name that should not die, and must

[1] But, he says: "Ubi adeptus literas Latinas, statim etiam in urbe nostrâ cognitus fui." De Vitâ Propriâ, cap. xxxii. p. 138.

[2] "Apud patrem longam servitutem sustinui, et pro spurio ab illo jactatus, etiam indecora matri simul audiebam." Dial. de Morte. Opera, Tom. i. p. 676.

[3] "Itaque quam licuit vixi mihi; et in aliquâ spe futurorum præsentia sprevi." De Propr. Vit. cap. ix. p. 42.

[4] De Util. ex Adv. Capiend. p. 428. De Propr. Vit. cap. xxxiv. p. 155.

[5] De Libris Propriis (ed. Lugd. 1557), p. 9.

needs sit down at once to write a treatise, and so make the best beginning that he could of the career to which his aspirations tended, there was no subject that lay nearer to his mind than the geometry he gathered from his father's teachings and his father's books. The boy, therefore, worked diligently at a little book in his own language, since he could write no Latin, wherein he taught how and why, the latitude and longitude of two places or stars being known, their true distance from each other may be calculated[1]. This little treatise was divided into chapters, and was chiefly founded on a book of Geber's[1]. Having achieved this his first work, Jerome was rather proud to lend it to a friend, Agostino Lavizario, of Como. To the disappointment of posterity, and the chagrin of the author, Lavizario died of plague, and Jerome's manuscript could never be recovered[2].

But the zeal of the young aspirant for immortal honours had not been content with labour on a single work[3]; another book had been commenced about the same time, more original in its design, and more ambitious, more peculiarly characteristic. As Cardan grew, his restlessness increased. He felt aggrieved when, at the age of eighteen, full of strong powers and strong passions, he still found himself compelled into a half-menial position,

[1] De Libris Propriis (ed. Lugd. 1557), p. 9.

[2] De Libris Propriis (ed. 1557), pp. 9, 10. De L. P. Liber ult. Opera, vol. i. p. 96.

[3] De Sapientiâ Libri V. &c. &c. (ed. Norimb. 1543) p. 431.

and denied the education for which he was thirsting. His want of proper standing had become more obvious, and the reason of it, with a galling frequency, was on the lips of his companions. His health was bad, his home was uncongenial, out of doors he was in a wrong position. He had become proud, and so sensitive, that his spirit suffered pain from any but the gentlest touch. Worldly advancement seemed impossible, restlessness became recklessness, and the neglected youth turned all the energy that was not spent in nursing his ambition upon games of chance. He brought his acquired taste for mathematics to the gaming-table, and calculated nicely probabilities in cards and dice[1]. When, afterwards, a sure object in life presented itself, quitting the company of gamblers, he pursued it steadily; but in the hopeless, miserable years of energy that saw no outlet, and of reckless discontent, there was no game played in his day with dice at which Jerome Cardan did not become proficient. Meanwhile, the philosophic bias was not weaker than the passions of those miserable years. The young gambler's experiences were all treasured for a philosophic use, while scientific calculations were submitted to the test of practice; for this other work, begun in early youth, and finished at the age of twenty-three, was nothing less than an original and elaborate treatise on the science that belongs to

[1] De Propriâ Vitâ, p. 16. The authority remains the same for all succeeding facts, until its change is indicated by another reference.

games of chance. The idea was a shrewd one, and the execution of it curiously brought into play all the characteristic features of its author's life. It displayed much of the knowledge he had acquired from the old geometrician Fazio, the philosophic powers that had grown and strengthened in the midst of all misfortune and neglect, and the love of dice that represented the impatient and ill-regulated spirit that so much want of sympathy had by this time begotten.

We who have seen the growth of this one child from the knees of its hired mothers, and the hand of its hard Aunt Margaret, up to a youth of galling servitude, refuse to be harsh judges now. If we could trace back the stories of the men who sin against us or before us in the world, perhaps we should refuse to be harsh judges ever. There is no truth in scorn, and there is no sadder aspect in the life of Jerome Cardan than the feeling which impelled him to say, "I have lived to myself, and in some hope of future things I have despised the present."

A rare example of the contempt of things present was offered during Jerome's youth by Fazio, his father. Fazio, who was, it should be remembered, seventy-four years old when his son's age was eighteen, had two nephews, sister's sons, little younger than himself; and of these, one was a Franciscan friar, and the other a tax-gatherer; one a Pharisee, the other a publican. The friar, seventy years

old, was named Evangelista; the other nephew, Ottone Cantone, the tax-gatherer, was very rich, and when on his death-bed offered to bequeath his wealth to the young Jerome. It was the one worldly gift that fortune offered to him in his early life, a bequest by which he would have been enabled to obtain for himself education, and to carry out his most ambitious schemes of study. Fazio, however, acting on his son's behalf, refused the legacy, declaring that the money was ill-gotten. The despised publican died, therefore, intestate, and his property passed into the hands of his surviving brother, the friar, who, being forbidden to acquire wealth for himself, of course devoted it to pious uses.

The geometer's contempt of wealth did not include a contempt of the homage he might earn to himself from younger relations, as a man who would leave one day a will behind him[1]. Jerome's health being delicate, it pleased his father to excite the reverence of other young men in the family, by telling them that in the event of his son's death this or that one of them would be his heir. It was a weak way of boasting, and hazardous withal; for in those days, although it was not much more likely than it is now that young men would allow generous blood to take a jaundice from exposure to such influencing, yet there were thousands of calculating fathers

[1] De Util. ex Adv. Capiend. p. 429.

not indisposed to carve out a fortune for themselves or for their children with the knife of the assassin, or to find quiet means of hastening the decease of any sickly youth by whom their way was cumbered. This manner of talking, therefore, on the part of the old man, not only vexed Jerome, but also seriously alarmed his mother, and was the occasion of much violent altercation between Fazio and Clara. They even agreed to separate. In one of these quarrels the passionate woman fell down in a fit, striking her head violently against a paving-stone, and lay for three hours insensible, and foaming at the mouth[1]. The son diverted the attention of his parents from the dispute, of which he was the centre, by simulating a religious zeal, betaking himself to the Franciscans[2], and making suddenly a bold push to secure for himself proper instruction. His mother, however, would not suffer that he should hide himself from her under the monk's cowl[3].

Having denied to him that easy opportunity of getting forward in the world which the legacy of Ottone Cantone would have afforded, it would have been cruel indeed had Fazio continued to withhold from his son those elements of education that were necessary to his labour for his own subsistence. Jerome had learnt no trade or profession,

[1] De Util. ex Adv. Capiend. p. 429.

[2] Ibid. De Consolatione, p. 74.

[3] "Metuentis matris orbitatem precibus exoratus pater." De Consolatione, p. 74.

and both from his nature, and from the imperfect training he had hitherto received, it was evident that he could earn his living only as a scholar. The old man also had not failed to recognise the good abilities his boy possessed, while it was certain that his quick wit could be turned to no account, that he might as well not think at all among philosophers, while he was unable to write his thoughts in Latin. At length, therefore, when he was nineteen[1] years old, he was, for the first time, released from bondage in his father's house, and sent to study at a university.

[1] De Consol. p. 74. De Propr. Vit. p. 16.

CHAPTER IV.

ILLS OF THE FLESH—THE STIPEND OF THE HUNDRED SCUDI.

THE spirit of the young Cardan, housed within its temple of the flesh, suffered, in contact with the world about it, such discouragements. The story of his outer life up to his nineteenth year is told in the preceding chapters. We must now put a finger on his pulse. The day may come when somebody shall teach us how to estimate the sum of human kindness that proceeds from good digestion and a pure state of the blood—the disputes and jealousies that owe their rise entirely to the livers of a number of the disputants—or how much fretfulness, how many outbursts of impatience, how much quick restlessness of action, is produced by the condition of the nervous matter. Such calculations, though we cannot make them in the gross, we make, or ought to make, instinctively when we become intimate with individuals. The physical life of a man cannot be dissociated fairly from his intellectual and moral life, when we attempt to judge him by the story of his actions. In the

case of Jerome Cardan, it is more than commonly essential that we know a little of the body that he carried to his work, for its unsoundness influenced his conduct and caused many a wise man to shrug his shoulders, both among contemporaries and long afterwards, and even to this day, over the question, "Had he not madness in his composition[1] ?"

As there are few, even of the rosiest among us, who have bodies absolutely free from all trace of disease or malformation, perfect health of body being a most rare condition, so it is with perfect health of mind. Every excess of one class of ideas over the just proportion involves loss of balance. Before reasoning can master the

[1] "Verum *extremæ amentiæ fuit*, imo impiæ audaciæ," reported Thuanus, in the History of his own time, Lib. lxii. Tom. iii. p. 462, ed. Lond. 1733. Gabriel Naudé, a famous bookworm, wrote an elaborate but shallow criticism on Cardan, which he prefixed to the book de Vitâ Propriâ, first edited by him in 1642. As an analyst of character Naudæus does not shine; but this criticism, based on a minute knowledge of his whole works, being bound up with the only one of Cardan's books usually read, has been taken for just by, I think, every succeeding writer. He says, speaking of . . . "gravissimorum virorum judicia, qui Cardanum miras de seipso fabulas concitasse, et *insanienti proximum vixisse*. Et hercle non video quid aliud existimari possit de homine qui" . . . qui . . . qui . . . &c. The quotation down to "qui denique" would be a page too long. Bayle, gathering his information about Cardan from other writers, and without having read more than a single book, which forms about a hundredth part of Cardan's works, delivers judgment thus: "We must not say of him that his great Wit had a mixture of Madness, but, on the contrary, that his Madness had a mixture of great Wit. His Wit was only an appendix, an accessory to his Madness." For my own part, I decline to affirm of any man that he is mad or not mad. Strange things are said and done all over the world daily.

unknown, or wit can dazzle us—before there can exist a Howard or a Milton—a mind must have swerved out of that horizontal line on which all faculties stand written at an equal altitude. That Cardan's mind was not well balanced we have already seen while noting its relations in the days of youth with the surrounding world. Much of the eccentricity displayed in it was caused, undoubtedly, by the condition of the frame in which it had been set. That part of our history—his physical life—up to the year in which he joined a university, we therefore proceed now to consider.

In infancy, Cardan was fat and red; in boyhood, lean, with a long, white face, and reddish hair. He grew fast, so that he had attained at the age of sixteen his full stature. Of the plague that caressed him at the breast of his first nurse mention has been already made. His health was at all times infirm. He was born with a slight enterocele, inherited from Fazio, his father. Throughout life he was vexed by the occasional outbreak of cutaneous eruptions and by nervous itchings[1]. Between his fourth and his seventh year[2] the excitement of his nervous system caused a condition perhaps not altogether rare in children; phantoms haunted him. On account of his

[1] De Vitâ Propr. cap. vi. and li. for the preceding details.

[2] De Vitâ Propr. cap. xxxvii. p. 160. Sprengel attributes to his early illnesses the vividness of imagination by which Cardan was always characterised.

weak health, and specially in consideration of the fact that during those years, and for some time afterwards, his legs from the knees downwards never became warm in bed until the morning[1], he was not required to rise; indeed, he was required not to rise until the end of the second hour after sunrise[2]. Fazio himself, it should be observed, was not himself then out of bed[3]. During the last hour or two of morning rest, lying awake, the boy commonly saw figures, that were colourless, and seemed to be built up of rings of mail, rising out of the right corner of the bed[4]. The figures, following each other in a long procession, were of many kinds—houses, castles, animals, knights on horseback, plants, trees, musical instruments, trumpeters in the attitude of blowing, groves, woods, flowers, and wild shapes that represented nothing he had ever seen before—these figures rising out of the right-hand corner, and describing an arch, descended into the left-hand corner, and were lost. Jerome had pleasure in this spectacle, and made a secret of it. On one occasion, when his eyes were fixed intently upon the procession, his Aunt Margaret asked whether he saw anything; but he believed, he tells us, that if he revealed the mys-

[1] De Vitâ Propr. cap. xxxvii. p. 29 and pp. 161, 162.

[2] Ibid. p. 11 and p. 160.

[3] "Somno matutino indulgere permisit, nam et ipse ad tertiam diei horam decumbebat." De Ut. ex Adv. Cap. p. 428.

[4] De Vitâ Propr. p. 160.

tery, whatever caused the spectacle would be offended, and that he should see the show no more[1]. Therefore he did not answer her. Between his seventh and twelfth year[2] the child, who slept between his mother and Aunt Margaret, disturbed them almost nightly with his crying, caused by severe palpitation of the heart, which ceased when he advanced in years[2]. The coldness of his extremities sometimes gave place to a profuse sweat. The nervous irritation endured by the delicate boy, who was rudely exposed all day long to the harsh exactions and unruly tempers of his old father, the lawyer, and the women who had charge of him, marred his unwholesome sleep with vivid dreams[2]. As often as a hundred times there came before him in his dreaming, night after night, at intervals, a cock with red wings, at whose appearance

[1] "Quamvis adeo puer, mecum cogitabam, si fatebor indignabitur quicquid causam præbet hujus pompæ, subtrahetque hoc festum." De Vitâ Propriâ, cap. xxxvii. p. 161. This account fits accurately to my own experience. During the same period of childhood I rarely fell asleep till I had received the visit of a crowd of visionary shapes that were not by any means agreeable. I had also, during that period, holiday phantoms, in the beauty and the mystery of which I took delight, and concerning which I had in the strongest degree the same childish belief that is mentioned in the text, that "si fatebor indignabitur quicquid causam præbet hujus pompæ, subtrahetque hoc festum." I add this note because there are some autobiographical statements in the writings of Cardan—touching upon what used to be considered supernatural matters—that are liable to question by the sceptical, or misinterpretation by the credulous. It would be unjust not to employ the best means that I have of proving in this place the good faith of Cardan's statements.

[2] De Vitâ Propr. p. 29.

the child trembled with the fear that it would speak, until it did speak, in a human voice, threatening words that took no hold upon his memory[1].

There were none by to understand the beatings of the young heart and the ponderings of the excited mind. Sometimes the child was labouring in the diseased heroic vein; at seven years old aweary of the world and cogitating suicide. Cardan, when he confesses this in after-life, adds a suspicion that the same has occurred to other men, although they do not like to tell it in their books[2]. There were none by to understand the vague emotions that were, even in youth, to grow into the form of hunger for undying fame; the busy brain, that was perpetually cogitating many and large things, revolving also things that were impossible[3].

The aspirations of the fevered mind were mingled

[1] De Vitâ Prop. p. 162.

[2] "Laboravi interdum amore Heroico, ut me ipsum trucidare cogitarem; verum talia etiam aliis accidere suspicor; licet hi in libros non referant." De Vitâ Propriâ, p. 31. The preceding sentences make it probable that Cardan applies this statement to his whole life; the sentence before which it is placed favours, however, the belief that he is referring to his childhood only. I adopt the latter view, because I know that in the early years of childhood this feeling is connected closely with the physical condition already described. There is nothing in it but a wild love for the mystery of death. I can call to mind no instance of suicide committed by a child.

[3] "Cerebri calidi, addictus cogitationi perpetuo: multa ac maxima, et etiam quæ esse non possunt revolvens." De Vitâ Propriâ, cap. xiii. p. 58.

always with some fear of early death. His mother never thought he would live long[1]. In youth, to all the other ailments Jerome suffered, there was added a dull, red swelling on the left breast, which occasioned for some time a dread of cancer[2]. In the year before his departure for the university, when he was eighteen years old, he suffered also a dangerous attack of illness. He had been rambling through an August day among the suburbs and gardens of Milan, and when he came home falsely accounted for his absence by saying that he had dined with a friend of his father's, Agostino Lanizario. It is the same Lanizario who played the part of friendly critic upon Jerome's early writings. After this walk the youth was seized with a violent attack of illness[3]. For three days he was in a fever, having only water for his food, and medicine compounded by his father, who was not only lawyer but physician also, which medicine he was to take four times a day. An anthrax formed and broke over the first false rib on the left side[4]. He thought in his delirium that he was on the bed of Asclepiades, rising and falling constantly between the floor and ceiling. He became possessed of the belief that he should die. His malady was closed by a violent sweat that resulted in the youth's recovery, but his health, as I before said, re-

[1] De Vitâ Propr. p. 29.
[2] Ibid. p. 31.
[3] Ibid. p. 28.
[4] De Util. ex Adversis Cap. p. 431.

mained always infirm; it was best when he was troubled with a cough[1].

Jerome Cardan, whose stature was completed at the age of sixteen, was, at the age of nineteen, when he went to Pavia, of the middle height and somewhat narrow-chested. He had a fair complexion, with a slight tinge of red on his white, small and oblong face, yellow hair, with a strong growth of it in beard under the chin, small, intent eyes, a projecting under lip, large upper front teeth, and a harsh voice, which, although loud, was not distinct at any distance. The hind part of his head was narrow[2]. Cardan tells us that when he became famous, and painters came from a distance to take his picture, his features proved to be so commonplace, that it was impossible to express them in a way that would enable any one to know him by his portrait. That is a very modest method of putting the incompetence of artists who omit the animating spirit when they paint the form, but Jerome was only too completely free from any pride either in his own form or in its coverings. In his mind he had pride, which he took no trouble to conceal. His character was fixed in a contempt of money, a disregard not only of surrounding trifles, but even of the more important furnishings of

[1] "Tum maxime sanum me existimem, cum tussi raucedineque laboro." De Vit. Propr. p. 26.

[2] Ibid. pp. 24, 25, for this and the next fact.

life, and his whole energy was bent upon the working out for himself with his mind of glory after death[1]. Boy as he was, he was at work upon his treatise on the Earning of Immortality; upon his treatise on the True Distances of Objects, based upon an old volume of Geber's, upon Triangles, that he had found among his father's books; upon his treatise on Games of Skill and Chance; and upon other youthful undertakings[2]. From the first he was unable to confine his mind to labour on a single topic. He did not sit down to work out his immortality of fame by writing a great book; he began at once with three or four books. He was never throughout life checked in the commencement of a new literary labour, by the reflection that he might have four or five unfinished works already in hand[3]. Book-writing was pleasure, and he could not easily deny himself any addition to a pleasure that he loved.

Though miserably trained into impatience, there was a strain of youthful joyousness in Cardan's mind when he arrived at manhood. The most prevailing of his sensual pleasures was a love of music[4]. He was not

[1] "Contemptor pecuniæ, gloriæ post obitum cultor, mediocria etiam nedum parva omnia spernere solitus."

[2] De Libris Propriis (ed. 1557), p. 10.

[3] "Multa et varia scripsi, neque enim mens tandiu intenta uni negocio esse potest." De Libris Propriis (ed. 1557), p. 12.

[4] "Lætus, voluptatibus deditus, Musicæ præcipue." De Vitâ Propr. cap. li.

physically bold, but he had from the beginning practised himself in sword exercise, then an art necessary to all men who desired long life, and he had exercised his body well in running and leaping. He could not ride decently, nor swim, and was afraid of fire-arms. Absolutely a coward he was not, for in his restlessness it was one of his favourite amusements to face at night the dangers of the street, wandering about, contrary to law, armed, having his face concealed by a black woollen veil[1].

Firm in the midst of all his restlessness, determined resolutely to mount upwards, not in worldly circumstance but in the ranks through which only intellect can rise, his spirit ever burning with an inextinguishable desire for an immortal name[2], Jerome Cardan left Milan to commence his university career. Agostino Lanizario had faith in the young author, and besought his aged father to consult the future prospects of the youth. Clara Micheria added her prayers to the same effect, stimulated by her son's declared intention, for the love of study, to become a monk if he might become a student in no

[1] De Vitâ Propr. cap. vii. p. 32, for the preceding details.

[2] "Hoc unum sat scio, ab ineunte ætate me inextinguibili nominis immortalis cupiditate flagrasse." De Libris Propriis.

"Cupiditas mea gloriæ, inter tot et adversa et impedimenta, stolida non tantum stulta. Non tamen unquam concupivi gloriam aut honores, imo sprevi: cuperem notum esse quod sim, non opto ut sciatur, qualis sim." De Vitâ Propriâ, cap. ix. p. 42.

other way[1]. Jerome, ill-trained as he had been, with all his oddities and faults, was a good son. The life of Fazio was now declining; Clara was much younger than the old geometrician, and must turn naturally after the old man's death to her son Jerome for protection. Let him, therefore, before it was too late, be enabled to earn bread. Fazio, though he had acquired some property, was far from being rich. He had lent money too carelessly, and been but too indifferent a steward of his own resources. The main prop of his income as a jurisconsult was a stipend of a hundred scudi, from a lectureship in Milan, which could one day be obtained also by Jerome, if he were qualified to take his father's place[2]. Clara had, therefore, good reason for backing with her prayers Jerome's demand for education. Jerome declared obstinately that if he were not sent to Pavia for instruction, he would run away from any situation into which he might be put; and thus the old man was at length entreated and compelled to yield[3].

[1] "Dii boni! florem hunc universum ætatis, et sine voluptate, et sine studiis transegi. Cum vero neque patrem cogere possem, nec fraudare honestum ducerem, nec precibus impetrare valerem: religioni tandem, amore studiorum, tradere me volui. Inde metuentis matris orbitatem precibus exoratus pater, in Gymnasium dimisit." De Consolatione, Lib. iii. p. 75.

[2] De Vitâ Propr. cap. x. p. 48.

[3] "Atque ita precibus matris et amici prædicti, minisque meis, ut qui omnino abire quoquo destinaveram, discessum in Academiam sequenti anno impetravi." De Libris Propriis.

Jerome Cardan, therefore, being as well or as ill-fitted for the career he sought as may be supposed of a youth minded as he was, and troubled as he was with fleshly ailments, set out at the age of nineteen for Pavia, provided in an ungrudging way by his father with respectable resources[1]. So far as studies were concerned, the exact curriculum of his preparatory education may be briefly told. In addition to reading and writing, Fazio had taught him rudiments of arithmetic when he was a little boy, and had instructed him, when he was nine years old, in some of the world's mysteries, magical lore very probably, whence obtained Jerome never discovered. Soon afterwards the geometrician taught his son some principles of Arabian astrology, a kind of study that must have done much to confirm the little fellow's dreaminess of nature, and then finding that his recollection of dry facts was bad, endeavoured to instil into him a system of artificial memory, in which endeavours he did not succeed[2]. After Jerome's twelfth year, he had been taught to say by heart the first six books of Euclid, not to understand them, and he had been aided carelessly with a few books and scanty verbal information and advice in the study of geometry and dialectics[3]. At the cost of his mother, who had a

[1] "Honesto cum viatico." De Ut. ex Adv. Cap. p. 429.

[2] De Vitâ Propr. cap. xxxiv. p. 155. De Ut. ex Adv. Cap. p. 428.

[3] "Pater jam ante concesserat ut Geometriæ et Dialecticæ opera darem, in quo quanquam præter paucas admonitiones, librosque, ac licentiam, nullum alium auxilium præbuerit." De Consol. p. 75.

woman's appreciation of such matters, Jerome had also received instruction in music, which, as a social amusement, consisted in those days chiefly of part singing and choruses. This Clara had furnished to her son without his father's knowledge[1]. Fazio himself, who had no lack of power for facetious conversation, and was great among his friends as a teller of anecdotes, fables, and marvels of all kinds, being particularly full of stories about demons[2], and claiming an especial demon of his own, aided the constant growth of superstitious feeling in the apt mind of his pupil. Other things Jerome had learnt for his own pleasure. With his father's help he had become so well versed in dialectics, that before he went to Pavia he earned some pocket-money for himself by giving private lessons in that study[3]. Of Latin he knew no more than he had acquired in conversation with his father; but to write Latin, as I have said before, was the great object of his young desire.

At Pavia, Cardan was placed under the care of Giovanni Ambrosio Targio, in whose house he resided without any companion. At the close of the academic year he returned to Milan. He had made good use of time, for in the succeeding year after his return to Pavia, where he

[1] De Ut. ex Adv. Cap. p. 429.

[2] "Conversatio sua haud aspernanda, facetus, jucundus, miraculorum et fabularum recitator, multa de dæmonibus recitabat, quæ quam vera essent nescio, certe ea historia et admirabilis et pulchre conficta, mirum in modum me oblectabat." De Ut. ex Adv. Cap. p. 429.

[3] Ibid.

again lodged with Targio, he disputed publicly with very great success, and was a teacher in the Gymnasium of the first books of Euclid. He even undertook for a few days to discourse upon dialectics in the place of the appointed teacher, Brother Romolo Serveta; and afterwards he took for a short time a class of elementary philosophy on behalf of a physician named Pandolfo[1]. He was evidently working hard, learning to read and write Latin, not by the ordinary way of grammar rules, but by practice and by native tact, with books and dictionaries[2].

The years of study now commenced were years of happiness to the young student. He worked hard, partly to make up for lost time, partly in fear that he might be recalled by his father if ill-tidings of him were sent home[3]. At Pavia he was master of himself, and between the sessions, when he went home to Milan, he assumed the right of managing his own affairs. His mode of studying was suited to his tastes, though perhaps not exactly orthodox. The common course of a day's study was as follows[4]:—After a morning's work he walked in the shade outside the town-walls; then he dined; then he gave up his time to music. The young philosopher then took his fishing lines and went a-fishing under shelter of the groves and woods not far beyond

[1] De Vitâ Propr. p. 16, for the preceding details.
[2] Ibid. cap. xxxiv.
[3] De Consol. p. 75.
[4] De Vit. Propr. cap. xl.

the gates of Pavia. A philosopher who means to be immortal must needs think as well as read and write. Cardan could either think or read while he was fishing. He took out with him also into the woods writing materials, and so studied and worked under the thick green leaves, among the wild flowers, throughout the summer afternoon, dreaming ambitious dreams, and fairly striving to fulfil his best desires. At sunset he returned into the town, where his behaviour was not always orderly. Dice and the draught-board had their charms for him; a restless night spent wandering about the streets after a day of music was, in his view, a simple kind of relaxation. In this way Cardan worked hard, and made rapid progress. Having embraced medicine as his profession, he had begun a treatise on the Differings of Doctors[1]. In the year following his second academical course, remaining at home in Milan because the presence of war caused the schools of Pavia to be closed[2], he wrote fifty sheets of mathematical Commentaries. These sheets, I may here add, he lent to Ottaviano Scoto: Ottaviano lost them.

Jerome Cardan had embraced medicine as his profession. What was to become, then, of the stipend of the hundred scudi? He had thrown it aside as dust in the balance of his thoughts. The choice of a profession was not

[1] De Sapientiâ, &c. &c. p. 420.

[2] "Tertio anno Mediol: mansi bello impeditus, quo ne Academia frequentaretur prohibitum est." De Sapientiâ, &c. p. 421.

to him a money question. Regarding it, however, even in that light, when his father and Clara pleaded to him the importance of this lectureship, and the honours and emoluments that were to be attained by all good jurisconsults, the youth felt that his father's standing in the world was but a bad endorsement of their plea. Jurisprudence, he remarked, had done but little for his father Fazio[1], though he had been lauded as the knower of all things in that book of his on Peckham's *Perspectiva*. To that book, and the laudation in it, Jerome refers, noting how very false the praise was, since his father's knowledge was confined to few ideas, and none of those his own. Law studies had contracted his mind—not enlarged it. Eager, therefore, for the best kind of mental cultivation as the basis of his future immortality, the young philosopher, after he went to Pavia, was not long in determining that he would never follow in his father's steps.

Medicine had recommended itself to Cardan as the pursuit most likely to beget a philosophic mind. As a physician, he could not only keep over his own feeble health a reasonable guardianship—and he desired long life—but he should also be more fairly on the path to an immortal fame. The studies that belong to medicine, he reasoned[2], stand upon surer ground than studies that

[1] "Parum illum etiam absque impedimento profecisse viderem." De Vit. Propr. cap. x. p. 49.

[2] Nothing could be saner than this reasoning:—"In eo instituto a primâ ætate mansi, ut vitæ consulerem: studia autem medicinæ magis

belong to law. Law treats of local custom, medicine of truths common to the whole world, and to all ages. Medicine is the nobler as well as the safer ground, he said, on which to build a lasting fame, since its inquiries are concerned only with pure reason, with the eternal law of nature, not with the opinions of men. Swayed by such arguments the bold student determined to give up every design of following upon his father's track, and abandoned expectation of his stipend of a hundred scudi.

Fazio, failing now in health, withdrew his opposition, and Jerome, having missed one academic course while the armies concerned in the quarrel between Charles V. and Francis I. were creating more than common tumult in the country, went in the next year, he being twenty-three years old, not again to Pavia, but to Padua.

Absence had softened the feelings of old Fazio towards his son[1]. Very soon after his first departure, reconciliation had been effected between Fazio and Clara; and although the old man, during the four last years of his life, maintained a morose countenance[2], his last days proved

huic proposito conducebant quam legum: et ut propiora fini, et ut orbi communia toti, et omnibus seculis: tamen ut candidiora, ac quæ rationi (æternæ naturæ legi) non hominum opinionibus inniterentur: ideo hæc ipsa amplexatus sum, non jurisprudentia." De Vit. Propr. p. 47.

[1] "Desiderium augente absentiâ mortuus est pater." De Consolatione, p. 75.

[2] "Supervixit quatuor ferme annis, mœstus semper vixit ut declaraverit quantum me amaret." De Ut. ex Adv. Cap. p. 430.

that he regarded his boy with a real affection. It was in the beginning of the year 1524 that Jerome first went to the University of Padua, and early in August of the same year he returned with a fellow-townsman, Gianangelo Corio, to Milan[1], where the old jurisconsult was languishing in mortal illness. Jerome, since he had become a Latin scholar, had acquired social respect among his fellow-townsmen[2], and his father was then so much interested in the progress of his studies that he would not suffer him to wait upon the sick bed. Plague was in the town, and the youth's life was precious[3]. Jerome, he said, was on the point of taking the degree of bachelor in arts[4], and Fazio, though near death, commanded him to go back; declaring, indeed, that he should feel the happier if he did not detain him from his studies[5]. The youth, therefore, went back to Padua. He must have gone back to vacation work, for he had remained a month at Padua after the close of the academic session on the 30th of June, and the long vacation did not end until All Saints'-

[1] De Vit. Propr. p. 16. [2] Ibid. p. 138.

[3] De Consol. p. 75.

[4] De Vit. Propr. p. 17. Such a degree was not much favoured in Italy. It was sought in Cardan's time chiefly by those who could not afford much expense or trouble, and in the next century was rarely sought at all in Padua, after the establishment of "the Venetian College," by which the doctorate was made readily accessible to all poor scholars. Gymnasium Patavinum J. P. Tomasini, p. 200 and p. 194.

[5] De Vit. Propr. p. 17.

day, the 1st of November[1], when the learned Paduans opened the academic year with great solemnity and pomp.

Soon after his return, Jerome received news of his father's death. Fazio died of old age, after eight days of abstinence from food, upon a Sabbath-day, the 28th of August[2]. His son, who was warm-hearted, had loved him; but there is more of literary vanity than filial love in the epitaph, of course a Latin one, with which he marked his grave. Thus the sense of the inscription ran:

To Fazio Cardan,
Jurisconsult.
Death it was that I lived, life it was death that gave,
There remains the mind eternal, certain glory, rest[3].
He died in the year 1524, *Oct.* 28, *in the eightieth year of his age.*
Jerome Cardan, Physician, to his Parent
and Posterity.

[1] See J. P. Tomasini Commentar. de Gymn. Patavin. Lib. i. pp. 150—4, for the complete University Calendar, formerly regulating work-days and holidays at Padua.

[2] De Vit. Propr. p. 17. Dialogus Tetim. Opera, Tom. i. p. 672. "*Tetim.* At Pater, quomodo obiit? *Rom.* Honeste, et ex senio."

[3] These two motto lines are in the original a bad hexameter and a pentameter; the whole inscription being:

"Facio Cardano,
I. C.
Mors fuit id, quod vixi, vitam mors dedit ipsa,
Mens æterna manet, gloria tuta, quies.
Obiit anno M.D.XXIV. IV. Kal. Sept. Anno Ætatis LXX.
Hyeronymus Cardanus, Medicus, Parenti
Posterisque."

The inscription is given by Tomasini (Elog. part i. Patav. 1630) from the church of St. Mark, in Milan. Jerome himself was eventually buried under it beside his father, as is testified by Tomasini and Thuanus.

Until there shall be one trumpet sounded over all the graves, we shall most likely continue to blow trumpets of our own in this way. A clever man must be more pious than clever who omits the temptation, when he has the power, to display his cleverness upon a tomb. By Cardan, who was more clever than pious, no such omission would be made. How should his piety prevail? The holiness of home, all sacredness of motive and true worthiness of action, had been unknown to the little Jerome when he was a child. He had grown up contemned and neglected, seeing much of evil passion, trained as a child in astrology, and strengthened in every tendency to superstition. The religion of his time was ceremonial and full of superstitious practices. Jerome was superstitious. He was careful to perform religious rites; he prayed to God and to the Virgin Mary, but more particularly to St. Martin, whom he was taught by a dream to regard as a protector under whom he would enjoy a somewhat quieter and longer life[1] than he could have obtained under any other saint. There can be no doubt that this was a direct slight offered to St. Jerome. Cardan was not behind his age, but he was not before it, when, as he tells us, he was accustomed from childhood to look up to heaven with this prayer: "Lord God, of Thine infinite goodness, give me long life and wisdom, and health both of mind and body[2]."

[1] De Vitâ Propr. cap. xxii. p. 87. [2] Ibid. p. 86.

His body was ailing, his mind wanted health; he feared lest, by a premature close to his life, he might be prevented from leaving to posterity such proofs of wisdom as might win for him undying praise. He sought praise as the end of his existence, and exercise of intellect as the most worthy means to such an end. Ambition to produce the utmost good, to develop every talent and apply it carefully to that work in which it would do all that it could be made to do in aid of the real progress of humanity, glorified the life of the obscure French potter, Bernard Palissy[1], really the best of Cardan's philosophical contemporaries. Cardan, who won to himself in his own lifetime world-wide fame, was conscious of no higher motive to exertion than anxiety to be remembered as a great philosopher. But that was no mean care.

Because the superstition of Cardan did not at all times take an orthodox complexion, he has been ranked on more than one occasion among atheists. Thus, for example, he was set down by Theophilus Raynaud, in his treatise on good and bad books[2], as the first atheist of the

[1] "Je n'ái trouvé rien meilleur que de suivre le conseil de Dieu . . Il a commandé à ses héritiers qu'ils eussent a manger le pain au labeur de leur corps et qu'ils eussent à multiplier les talens qu'il leur avoit laissez par son Testament. Quoi consideré je n'ay voulu cacher en terre les talens qu'il luy a pleu me distribuer," &c. Palissy to the Marshal Montmorenci.

[2] "Homo nullius religionis ac fidei, et inter clancularios atheos secundi ordinis ævo suo facile princeps." Father Reynaud De bonis ac malis Libris, quoted by Bayle in his Dictionary.

second order. He records, however, emphatically among the experiences of his life the acquisition, even through trouble, of a firm trust in the wisdom of the divine disposition of events. He had observed, he says, the efficacy of prayer, and recognised the importance of invoking aid from God out of the Scriptures, and of seeking, he adds —I quote his exact words—"that He would teach me to do *His* will, because He is my God[1]." As a religious sentiment, at least, this thought lay at the bottom even of those blind superstitions or clear-sighted comments which the orthodox disdained and set aside as pagan.

[1] De Vit. Propr. cap. xxiii. p. 90.

CHAPTER V.

JEROME CARDAN. GRADUATE IN MEDICINE—HIS LIFE AT SACCO, AND THE STRANGE ADVENTURES OF HIS MARRIAGE.

FAZIO CARDAN left a house and some provision for his son, although it seems to have been very small, and liable to much dispute[1]. He had been too ready to allow to other men the use of his possessions. Part of his little store, placed in the hands of insolvent people, had been lost; part, supplied to princes and great men, was to be re-demanded only at great risk, and hardly to be recovered after endless labour. When recovered, it was always repaid without interest[2]. Litigation, however, was then common; and we are carried back fairly into the spirit of the time when we read that after his father's death Jerome had first a lawsuit with Alessandro Castillione for some woods, afterwards with members of his father's family, and then with the Counts Barbiani. Jerome eventually gained his point against Castillione, who had one of his

[1] "Patrimonium quod minimum erat." De Consol. p. 75. De Vitâ Propr. cap. xxviii.

[2] De Ut. ex Adv. Cap. p. 428.

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own relations for a judge, and compelled him, after a long struggle, to pay all the money about which a question had arisen. The dispute with the Barbiani was continued over many years[1].

To Clara Micheria there remained also, after the death of Fazio, so much provision for her maintenance as would enable her to buy a house[2]. She could also in some way earn money, for it was by her industry and solicitude—incredible solicitude her son entitles it—that Jerome, when left by the death of his father poor and helpless, was maintained at the university[3]. It does not appear that Jerome and his mother were at all times happy in each other, but that Clara, notwithstanding all her sins of temper or of principle, had a woman's power of self-sacrifice, and a mother's strength of love for Jerome, is what I think does appear, not indistinctly. Towards his father, Jerome's heart yearned many years after the old man had passed away, when the son could look back into his youth, forgetting for a time its deprivations, remembering only the gentle words and deeds of the geometrician, who had, he thought, been kinder to him than his mother. Of him he could then write, when the feeling rose naturally in his heart, words of emotion full of a love and gentleness, with

[1] Dial. de Morte. Opera, Tom. i. p. 676.

[2] De Vit. Propr. p. 92.

[3] "Ipse inops, ac auxilio omni destitutus, diligentiâ et solicitudine matris incredibili sustentabar." Dial. de Morte. Opera, Tom. i. p. 676.

which he seems to have been able to regard his father only. "My tears arise," he says, "when my mind ponders upon his good-will towards me. But, father, I will give what satisfaction I am able to your merits and your piety. And while these leaves are read, your name and virtue shall be honoured. For he was incorruptible and truly holy[1]." At other times, in softened mood, we find him speaking of his old relation to his father during childhood, as "what I at that time thought to be hard servitude." At other times he writes the simple truth, but not resentfully.

Matthew Curtius, a physician of some note in his day, was professor of the theory of medicine in Padua, between the years 1524 and 1530[2]. He encouraged Cardan greatly with his kindness, even condescending to hold public disputation with him. A compliment dear to the

[1] De Ut. ex Adv. Cap. pp. 349, 350.

[2] Riccoboni de Gymnas. Patavin. Lib. i. p. 21. Cardan de Vit. Propr. cap. xxxiv. p. 155. Curtius of Pavia taught also at Florence, Bologna, and Pisa. He wrote on Venesection in Pleurisy, on the quality of water, and also, among other things, edited Mundinus, the peg-book upon which anatomists had hung comments for years, until Vesalius achieved a revolution in their science. Curtius was fifty years old, and in the height of his reputation, when Cardan studied under him. His salary at Padua had been twice raised. He died in 1544, aged seventy. Brief details are given concerning him by Tomasini and Papadopoli in their records of the University of Padua, and more by Ghilini, whom I know only as cited in a work invaluable for the information it gives about forgotten men who were in any degree famous in the sixteenth century, "Zedler's Universal Lexicon aller Wissenschaften und Künste."

young man at the outset of his medical career, was the exclamation of the president before whom he argued some forgotten thesis against a forgotten doctor. The president, struck by Cardan's acuteness, asked who the youth was, and being told, exclaimed, "Study, O youth,—you will excel Curtius[1]."

At the close of the year made memorable by his father's death, Jerome Cardan obtained from his university the honour of being appointed Rector of the Gymnasium[2]. He very truly says, that the seeking of that office by him was a most desperately foolish deed[3]. The office was, in fact, the lordship of the university, a post so costly to the holder, that in those days of wars and taxes, and of social disorganisation in North Italy, nobody could be found willing to hold it. It was in abeyance at the time when Jerome Cardan, a clever, penniless, disreputable young scholar of twenty-four, maddened by difficulties, and by a belief that he was impotent for life (his sorest care), plunged desperately into its responsibilities, willing to drown one care in another.

The University of Padua, founded in the thirteenth

[1] De Libris Propriis:—"Stude, o juvenis, Curtium superabis." Stupebant omnes, adds Cardan.

[2] De Libr. Propr. (ed. 1547) p. 11. Lib. Ult. Op. Tom. i. p. 97.

[3] "*Studio vero id egi*, quod Rector Gymnasii Patavini effectus sum, tum cum inops essem, et in patriâ bella maxima vigerent et tributa intollerabilia. . . . *Deus! quid te ad hoc compulit? Ira certe et insania* . . ." De Ut. ex Adv. Cap. p. 430.

century, had been supported by the Princes of Carrara till their power rotted. Then the Gymnasium was placed, together with the town, in 1405, under the shield of Venice, the town keys and seal being presented in that year to Michael Steno. The liberality of the Venetians caused the university to prosper greatly, and it owed much in the first years of its dependence upon Venice to the liberality of rectors[1]. Until the year 1550, there were two rectors yearly appointed, who held divided rule, the university itself being divided between artists (followers of theology, philosophy, and physic) and jurisconsults. As the affairs of the two classes were separate, each had its rector. Jerome, we have seen, joined the artists, not the jurisconsults, who had then for their own use a distinct

[1] The best accounts of the University of Padua in its good old times are, I believe, the six books of Commentaries on the Paduan Gymnasium, by Antonio Riccobone (Patavii, 1598), the Paduan Gymnasium, in five books, by the Bishop J. P. Tomasini (Utini, 1654), and the History of the Paduan Gymnasium, by Nic. Comn. Papadopoli (Venet. 1726). I have used these as my authorities. Riccobone lived partly in Cardan's time, but Tomasini's work is more serviceable, inasmuch as it is full of those minute details which give life to our knowledge of the past. It is quite the best work of the three. The two volumes of Papadopoli, Abbot of St. Zenobius, and Professor at Padua of Canon Law, are of great service as an elaborate appendix to the others. He made it his business not only to compile afresh (drily enough), but to supply from the university records the omissions that occurred in the lists of rectors, professors, &c., published by the two first-named writers. He gives also a brief account of every Paduan who had been famous, including, of course, Cardan. Cardan's name, however, as of one who had held office in the university, does not occur in any of the lists given by these chroniclers.

university building. After the year 1550 an union was effected, and the university was governed by one rector, chosen alternately, if possible, from among the artists and the lawyers[1]. It was not possible always to maintain a strict rotation; it was even sometimes necessary to look abroad for a man "illustrious, provident, eloquent, and rich," by whose munificence the university could profit. The rector was, indeed, the chief magistrate of the university, who decided judicially disputes among the students and professors on fixed court days, who overlooked the working of the entire system, and saw that the teachers did their duty properly; but his administrative labours were lightened by the aid of a pro-rector, who did the real work, while of the rector himself no more was required than to be munificent. Scholars who would be dukes hereafter were the men thought most proper for the office. So indeed they were, for often rich men, daunted by the heavy demand made by it upon their purses, used the right of refusal granted to them. In the next century the rectorate was shunned so universally, that the office ceased almost wholly, the chief dignitary being the pro-rector, of whom work was required rather than money.

For seven years before the year 1515, wars in the district had caused the closing of the University of Padua.

[1] Papadopoli Hist. Gymn. Pat. Lib. i. cap. v. p. 7, for preceding details. Tomasini, Lib. i. ch. xix. to xxii. for those next following.

After it was re-opened, the prevalent confusion and distress made it impossible to find men who would add to all their other worldly loss the burden of the rector's office. For about ten years after that date, therefore, says a chronicler of the university[1], there were no rectors. In 1526 there is set down the name of one, and there was one in each of the two succeeding years. In 1529 there was again a rector for the jurisconsults, and another for the artists. The year, therefore, of Cardan's rectorate, 1525, is considered blank, and although Jerome, after two ballots, by a majority of one[2], obtained leave to assume the responsibilities which every wise man declined, he took none of the honours of the office. It entitled him at once[3] to the degree of doctor without trouble or expense, but the degree was shortly afterwards refused to him. I do not think that he was enrolled as a citizen of Padua, and I am sure that he was not admitted at Venice into the equestrian order. He seems, in fact, to have received none of the rector's privileges, and he was accounted nobody by the university, his year of office being called

[1] Papadopoli, vol. i. pp. 95, 96. The list of rectors is there interrupted thus at the year 1508. "Re Gymnasticâ intermissâ ob Cameracense bellum, mox restituta anno MDXV, à restitutione per annos circiter decem Rectoribus caruit Gymnasium." The list is then resumed at the year 1526.

[2] Cardan de Vit. Propr. p. 17.

[3] The succeeding particulars concerning the office of Rector of the Gymnasium at Padua in the sixteenth century, are from Tomasini's first book, ch. xix. to xxii.

the last of the ten years in which there was no rector.

We may feel assured, also, that the bishop and the local magistrates, and his brother the town rector, did not come in state to visit the new dignitary, and that he did not go with due solemnity—as a true rector ought to go after his election—to the cathedral, escorted by two hundred spearmen, accompanied by the officials of the university on horseback, and by fife-players, and whatever else is noble. I even doubt whether they clothed him as a rector should be clothed—in summer robes of scarlet silk, and winter robes of purple silk—and hung the badge over his back, covered with gold and precious stones. If all these forms were properly gone through by the learned Paduans in honour of the young adventurer who undertook to preside over them, that journey of the desperate young Jerome, clothed in purple and gold, and surrounded by spearmen, to the solemn hearing of high mass, would form as odd a picture of times out of joint as any man could easily imagine.

That the professors and dignitaries of the university came solemnly to dinner at Cardan's expense I can believe. That the students flocked together to the great inaugural entertainment he was bound to give them, and to any of his other little official dinners, I am sure. Wild dinners they must have been, for Jerome looked back upon the

year when he was rector as a year of "Sardanapalan life," a blot upon his past for which he had to make atonement[1]. And who found the money to support him in his false position—who paid for the mock-majesty of Rector Sardanapalus? The widow at Milan. His mother—we do not know how—worked for him, and by her self-denial and solicitude he was enabled[2] to sustain the charges that he had so foolishly and recklessly incurred. Perhaps she was proud of his distinction, unsubstantial as it was, but proud or not, she was his mother. Except his mother's help, he had no means of income but the gaming-table[3].

Cardan had not at the university a large circle of friends. Except when he sought wild pleasure in a game of chance, or men with whom to sing, he was, in his studies and his recreations, almost a recluse; he thought that few who might be his companions were virtuous, none truly learned, and with a false cynicism he regarded social intercourse as waste of time. Yet he had formed in his youth a friendship, based upon community of tastes

[1] In chapter xiii. p. 59 of the De Vitâ Propr. Liber, he speaks of penance due—"ut *vitæ Sardanapalæ* quam anno quo præfui Gymnasio Patavino egi, flagitia purgaverim."

[2] "Matris tamen sollicitudine effectum est, ut pondus impensarum, quamvis segre, sustinuerim." De Ut. ex Adv. Cap. p. 430.

[3] "Studentium Rector creatus, nihil prius cum haberem, totum tamen illud nihil consumpsi. Nec ullum mihi erat reliquum auxilium, nisi latrunculorum ludus." De Consol. p. 75.

for dice and music, with one Ambrose Varadeus; afterwards he had found a friend at Pavia in Prosper Marinon. A pallid youth, Ottaviano Scoto, of Venice, who lost fifty sheets of Cardan's early efforts as an author, was a friend with whom the young student was upon familiar terms of lend and borrow as to books and money[1]. This was his closest intimacy; out of it sprang one of the leading events in his after-life. Another of his close friends was Gaspardo Gallcarato. Love of pleasure counteracted, in a great degree, Jerome's desire to play the misanthrope. In society he had also the satisfaction of rasping any tender point in a discussion. As much through love of argument as malice he perversely advocated the opinions that were most distasteful to his company[2], and loved a single combat of the tongue, in which it appears that he never failed to silence his opponent, for he could bring into play not only a quick wit and a rare amount of ready knowledge, but he could assume also a tone so rude and overbearing that few who had contested with him once would court a second battle.

Though the natural gifts and acquirements of Cardan were disfigured by harsh feeling towards others and an obtrusive consciousness of self, it is curious to observe how

[1] De Vit. Propr. cap. xv. p. 68.

[2] "Illud inter vitia mea singulare et magnum agnoscō, et sequor, ut libentius nil dicam quam quod audientibus displiceat, atque in hoc, sciens ac volens, persevero." De Vit. Prop. cap. xiii. p. 60.

in his mind the vanity of the scholar was combined with, and perhaps, indeed, formed but a part of, a most rare candour in self-confession. Desiring and expecting an immortal fame, Jerome was thoroughly determined to enable all posterity to know what manner of man he was. Revelations of himself are to be found scattered throughout the huge mass of his writings: those revelations are collected here into a narrative, and we have had reason already, as we shall have more reason hereafter, to wonder at the unflinching way in which the Milanese philosopher must have performed self-dissection, when he laid bare so much that was corrupt in his own nature to the public gaze. To nobody was he so merciless as to himself, he scorned the men who, being dark within, study to show a brilliant outside to the world, and going over, as he always did, into a state of bold antagonism, he hung out every one of his misdeeds, and all that he found rotten in himself, for popular inspection.

Readily confessing cowardice, Cardan tells of a storm on the Lago di Guarda, in which he was nearly drowned. It was in the year in which he was rector, at a time when he was forced by want of funds to make an expedition homeward[1]. He had pushed off into the lake, unwillingly enough, with a few companions, and they had on board

[1] "Pecuniarum exigendarum causâ." De Ut. ex Adv. Cap. p. 430. To make work for his mother.

the boat some horses. Their sail was torn, they had their mast broken, lost also their rudder and one of their two oars, when night came on. At last they came ashore at Sirmione, when they were all despairing of a rescue, Cardan most of all. They came ashore in good time, for very few minutes afterwards, when they were housed safely in their inn, a fierce burst of the storm arose, which their disabled boat could by no chance have weathered. The iron hinges of the windows in the inn were bent by it. Jerome, who had been out of doors a confessed coward, tells philosophically how all his valour came to him when a fine pike was brought to table, and he supped joyously, though his companions could not eat. The only youth, except Cardan, who had an appetite, was he whose rashness led the party into danger, and whose courage found a safe way out of it[1].

But the scholar who was bold over his supper, and cared little for the howling of the wind outside, may have lost something of his boldness when the lights were out and the loud wind at night hindered him from sleeping. His philosophy had comprehended studies that gave strength to superstition. Astrologers had predicted from his horoscope that he would not live to be older than forty or forty-five; and he, believing them, took no pains in the management of his inheritance to reserve any

[1] De Vit. Propr. cap. xxx. p. 111.

provision for old age Illusions of the senses, to which he was subject, strengthened his belief in supernatural appearances, and his own nervous, dreamy nature caused him to convert at times the memory of common events into some hazy impression of the wonderful. I have not thought it worth while to collect together all the stories of this kind related by Cardan; but two may serve here as examples. At Pavia, one morning while in bed, and again while dressing, Jerome heard a distinct rap as of a hammer on a wall of his room, by which he knew that he was parted from a chamber in an empty house. At that time died his and his father's friend, Galeazzo Rosso[1]. The disciples of certain impostors who in our own day have revived a belief in spirit-knockings in New York, may be referred to the works of Cardan for a few enunciations of distinct faith in such manifestations A more curious example will occur hereafter. In the present instance, Cardan, who is never destitute of philosophic candour, owns that he was unable to prove any strict correspondence of time between the death of Rosso and the knockings in his room. It is enough for us

[1] De Vit. Propr. cap. xlvii. p. 222. I quote the passage for the benefit of Rappists: "Quod mihi accidit dum studerem Papiæ, ut mane quodam, antequam expergiscerer ictum in muro senserim; vacuum erat habitaculum quod loco illi erat contiguum et dum expergiscerer, et postea alium, quasi malleo, et quod eâdem horâ vesperi intellexerim obiisse Galeazium de Rubeis amicum angularem, et de quo tam multa, non id referam in miracula."

simply to note how frequently the ear as well as the eye is deluded, when the nervous system is in a condition that appears to have been constant with Cardan. The sounds heard by him at Pavia portended no more than is meant by the flashes of light which sometimes dart before our wearied eyes.

We do not find greater difficulty in perceiving with how much ease Jerome may in lapse of time have fallen into the belief that a supernatural event marked his first experience in Latin. "Who was the man," he says, "who sold me a Latin Apuleius when I was, I think, about twenty years old, and instantly departed? I bought it without judgment, for its gilded binding; but the next morning found that I could read it. Almost at the same time I acquired the power of understanding Greek, Latin, French, and Spanish, that is to say, so that I could understand books in those languages, though unable to speak them and ignorant of their grammar[1]." There is nothing in this superstitious suggestion inconsistent with the record left by Cardan of the time spent by him in acquiring languages and studying their grammar. In his early college days he bought a Latin Apuleius. He had been superficially practised in Latin by conversation with his father, and the language differs not so greatly from Italian as to make it wonderful that

[1] De Vit. Propr. p. 225.

any youth of quick and ready wit should find that he could make out at once the general sense of a Latin story. Any shrewd man acquainted with Italian can scramble at first sight through the meaning of a Spanish book, and of French, another allied tongue, young Jerome must have picked up a great number of hints from the French armies that overran his native district.

After the purchase of his Apuleius, the student may have prided himself much on the discovery of the great deal that he could extract from books in these languages, before they had become, or when they had not long become, matters of systematic study. The seller of the Apuleius could be looked back to at last from a distance of time as though he had been one of the legendary beings who come into the market-places to sell magic books, and then are seen no more. The impression would accord well with his superstitious fancy; he himself would very soon believe it, and could easily let Greek slip insensibly into the list of tongues miraculously placed within his power. It is no proof of deliberate untruth that Cardan has put down among the mysteries of life this vague impression in one place, but does not the less candidly relate elsewhere the pains with which he toiled along the usual paths of study.

Those paths led him, at the beginning of the year 1526, to the attainment of one object of ambition. He was in

that year laureated Doctor of Medicine. His admission to the dignity was not, however, easily accorded. Having been presented by his teachers, and proved himself before the bishop orthodox and loyal, it was the duty of Cardan, as of any other candidate, to defend publicly four theses, two of them selected by himself. His opponents in discussion were, as usual, the junior doctors; afterwards he himself, with those by whom he was presented, having withdrawn, his admission or exclusion was determined by a ballot[1]. Jerome had been at first rejected, in spite of his rectorship—perhaps even because of it—by a compact body of forty-seven dissentients. On account of his birth, disgrace attached to his name; his love of dice, and various irregularities, must certainly have brought him into much disfavour, while his obstinate and disputatious method of asserting his opinions, and his contempt of custom, must have scandalised many of the magnates of the university. He was rejected twice; but when he made his third effort, the adverse voices were reduced to nine[2], and he was admitted Doctor of Medicine, and received with due solemnity the open and shut book, the barette, the ring, and the kiss. The open book signified things known to him that he was authorised to teach; the closed book signified the knowledge that it yet remained

[1] The details concerning the installation of a doctor here given are from Tomasini, Lib. i. cap. xlvii. pp. 159, 160.

[2] De Vit. Propr. p. 17.

for him, and was his business, to acquire. The barette was of an ecclesiastical form, and signified that he was consecrated as a priest to science, and by its name (bi-rect), twice right, some thought it also signified that teachers ought to be correct in practice as in theory. By the ring he was espoused to his profession. The kiss was the symbol of the brotherhood to which he was admitted, and the peace and harmony that should prevail among all fellow-labourers in art or science. Then in the cathedral he was ushered by the bedel formally from a seat by his presenters to a seat by the prior, further symbolising that, as a man of learning, he was qualified to sit among the princes of the earth. So Jerome was made a doctor in the famous University of Padua. He was then twenty-five years old.

Having obtained this qualification, Cardan, without loss of time, proceeded to establish himself in practice. An opening was found for him at Sacco, to which place he went, by the advice and with the help of a zealous friend, a physician of Padua, Francisco Buonafede[1]. Buonafede had been a warm promoter in the university of Cardan's claim to a degree. He himself held rank at Padua between the years 1524 and 1526 as the first of the two extraordinary professors of the Theory of Medicine, his

[1] De Ut. ex Adv. Cap. Lib. iii. p. 431. De Libris Propr. (1557) p. 12.

colleague being Peter Maynard, of Verona. Buonafede next became the second extraordinary professor of Practical Medicine, in which department he became senior professor in 1539[1]. He was a man of great worth, who felt towards the young student disinterested friendship, for Cardan had not attended any of his lectures[2]. Sacco is a small town, about ten miles from Padua and twenty-five from Venice.

Battle and murder, plague, pestilence, and famine, deterred Cardan from residence at Milan. During the six or seven years spent by him at Sacco, his own district was devastated by a succession of those evils that characterised in most parts of Europe the low social condition of the age. While Jerome pursued his studies at the university, the slaughter committed by the plague in his own district had been merciless. In 1522 fifty thousand of the Milanese died of the plague in four months. In 1524 there had been fierce plague, and by the fortune of war Milan had twice bowed to a new master. In 1526 and 1527, while Cardan dwelt at Sacco, Milan suffered under scarcity, that was made more distressing by the added burden of intolerable taxes. In 1528 disease and pestilence again broke out, and were less fearful in their ravages only because they had already swept off a large

[1] Gymn. Pat. Riccoboni, p. 23. Tomasini, p. 314.

[2] De Vit. Propr. p. 18. The same authority covers the facts stated in the succeeding paragraph.

part of the population of the district. In 1529 the miserable wars abated, and Cardan made an attempt to fix himself in Milan, for he regarded that town as his proper home. The attempt failed, as will presently be shown, and the adventurer having returned to Sacco, continued to live there during three or four more years.

At Sacco, in which town he began to reside—by way of omen perhaps—on his birthday[1], that is to say, on the 24th of September (1526), Cardan established himself in a house of his own, practised his profession, gambled, spent his money, and had no lack of holiday friends. The belief, founded on his horoscope, that he would die in middle age, and a desponding sense of inability to marry, caused the young physician to care little for the morrow. The consciousness of impotence had weighed upon him for about four years when he went to Sacco, and continued unabated until he was more than thirty years of age[2]. It was the greatest trouble of his life during those years which formed, in other respects, the happiest part of his existence. To feel, or to confess, that he was absolutely happy was not in the nature of Cardan. The conditions necessary to true happiness were absent from his mind. To the child whose character is forming the accidents of

[1] De Libris Propr. (ed. 1557) p. 13. A work entitled "Epidemia" begins thus:—"Anno MDXXVI. die XXIV. Septembris quæ mihi natalis fuit, contuli me in Saccense oppidum."

[2] De Ut. ex Adv. Capiend. Lib. ii. cap. 9.

outer life are events of real importance, happy or unhappy in themselves, but in the man whose character is formed the outer life is subject to the inner. I have taken pains, as I thought just, to call attention to those incidents of Cardan's youth which had a baneful influence upon his character. The child Jerome it was right to handle tenderly, but now that he has grown up, and has come out into the world to take his part in it as independent worker, he must run alone, for he is too old to be nursed by a biographer.

In his own morbid way Cardan tells us that as there are short giants and tall pigmies, so when he says that he spent at Sacco happy days, we must understand them to have been happily wretched[1]. He enjoyed games of chance, indulged his love of music, rambled through a beautiful country, dined and studied indolently. Nobody molested him, he spent his money and he had his friends, he was respected, visited by gay Venetian nobles. The magnates of the town associated with him, he kept open house, and men gathered about him, prompt enough to own that Jerome Cardan was a great philosopher. This cheerful bit of Cardan's life extended over five years and a half, commencing in September, 1526, and ending in the month of February, 1532, not very

[1] De Vitâ Propr. cap. xxxi. p. 129. The authority remains the same until there occurs a fresh citation.

many weeks after his marriage. He had enjoyed fairly his student life, but to the years spent at Sacco he looked back often afterwards. They contracted in his memory into a single happy thought, a thought to which, at night, his pleasant dreams frequently led him.

He studied while at Sacco indolently, or at any rate his study produced small immediate results. During the six years spent there his mind was at work, but that was a period rather of growth than produce. Cardan himself says, discontentedly, "During all the six years that I practised my art in that town, with great labour I produced but little profit to myself, much less to others." (Yet he was by no means wholly without practice[1].) "I was impeded by crude thoughts and restless studies, my wit not working smoothly or to good effect[2]." His written work during that period, except an essay upon Cheiromancy, an art in which Cardan had more faith than a modern gipsy, was entirely medical. It consisted of three hundred sheets, upon the Method of Healing; a treatise to the extent of thirty-six sheets, on the epidemic that prevailed in his neighbourhood during the whole time of his residence at Sacco; a treatise on the Plague. The treatise on the Plague was lost, and there were two other treatises destroyed also by the misdeed of a cat,

[1] De Consolatione, p. 75.
[2] De Libris Propriis. Liber ultimus. Opera, Tom. i. p. 97.

one De Re Venereâ, the other upon Spittle[1]. The three hundred sheets upon the Method of Healing, Cardan proposed to arrange in four books, putting into the fourth the remedies for the compound diseases. Of the early works of Cardan, and of the teachings found in them, it will be my duty to speak more at large in the succeeding chapter.

Two persons Jerome names especially as having been his friends while he lived at Sacco. One of these, Paolo Illirico, was a druggist, with whom he came very naturally into contact. His other friend was Gian Maria Mauroceno, a Venetian noble[2]. This may or may not be the same senator who was concerned in the disreputable quarrel next to be related, but the hero of it was more probably a nobleman named Thomas Lezun, who is elsewhere mentioned[3]. I shall best illustrate the bold way in which the philosopher speaks evil of himself, by putting down the worst part of this tale in his own words. They, however, who are familiar with the personal records that have been left to us by men of the world who lived and acted in the spirit of the sixteenth century, will know that the rude passion of Cardan was very little out of harmony with the coarse temper of the times[4].

[1] De Sapientiâ, &c. p. 422. De Libris Propriis (ed. 1557), p. 13, where he says of the two spoilt treatises, "ambo hi libri corrupti sunt urinâ felis." The same fact he records again elsewhere.

[2] De Propr. Vitâ Liber, cap. xv. [3] Liber de Ludo Aleæ.

[4] I may suggest a recollection of the Memoirs of Cellini.

"When I was at Venice," Jerome tells us[1], "at the festival of the birth of the Virgin, I lost my money at cards, and on the next day what remained; but I was in the house of the man with whom I played. When, therefore, I noticed that he used foul play, I wounded him in the face with a poniard, but slightly. There were present two youths of his household, and two spears were hanging from the rafters, and the house-door was fastened with a key. But when I had taken from him all his money, both his own and mine, having won back early that morning, and sent home by my boy the clothes and rings that I had lost to him on the preceding day, I flung back to him, of my own accord, some of the money, because I saw that he was wounded." Having achieved so much, Cardan pointed his sword at the two servants, and threatened death to them if they did not unlock the door and let him out. Their master, balancing the cost in his own mind, and finding, says Jerome, that what he had now lost was not more than he had previously taken, bade that his assailant should be suffered to go unmolested. The fierce passions awakened in the gambler made such scenes no doubt sufficiently familiar, and the Venetian either was conscious that he had provoked an attack, by being guilty of the charge upon which it was founded, or he was a hospitable, kindly man. He took

[1] De Vitâ Propriâ, cap. xxx.

the dagger-thrust in friendly part and bore no malice, for there is a sequel to the story.

On the same day, while Cardan was wandering about, with arms under his clothes, endeavouring to avoid the wrath of the chief magistrate for his assault upon a senator, after dark his feet slipped and he fell into one of the canals. By clinging, in his struggle, to the oars of a passing boat, he obtained rescue at the hands of the rowers, and was dragged on board. He found on board his adversary, with a fillet round his face, who covered him not with reproaches, but with a dry suit of his own clothes.

After he had dwelt two years in Sacco, Cardan, never strong in health, was attacked by tertian fever, ending, however, on the seventh day. A year afterwards, in 1529, there being a slight remission of the plague and tumult in Milan, Jerome, summoned by letters from his mother[1], returned to his own town, and there endeavoured to obtain his enrolment among the members of the College of Physicians. But the old stain of illegitimacy clung still to him in the company of those men who had known him as a boy. The respectable body of the physicians of Milan would admit no bastard into their society, and they rejected him, upon a suspicion of illegitimacy based, as its victim tells us, upon the ill-treatment he had expe-

[1] De Consol. p. 75.

rienced from his father[1]. When Cardan is relating facts, the neglect of his son by the geometrician cannot be kept out of sight; when he expresses feelings, however, a sentiment of filial affection, and a tender recollection of the old man's latest sympathies, prompt nothing but panegyric of the dead.

His rejection by the physicians of his own town for the reason assigned, inflicted a fresh hurt upon the sickly spirit of the young philosopher. He entreated also, while in Milan, for some satisfactory adjustment of his claims against the powerful Barbiani family[2]; but from the Barbiani he obtained no settlement. He found his mother also sullen; and having experienced in Milan *insult* and disappointment, with much bodily and mental toil, he went back to Sacco in a hectic state, half convalescent from a desperate complaint. He had been oppressed at Milan with worldly cares, the sense of which was rapidly supplanted by the expectation of death[3]. Cough, ulcers, and fœtid expectorations, caused all who were about him

[1] De Consol. p. 75.

[2] De Propr. Vit. p. 19. De Consol. p. 76, where he writes—"Interim vero cogita quæ curæ quæ tristitiæ animum meum vexare debuissent. Hinc paupertas maxima, illinc mater flens orbitatem et suam miseram senectutem, tum memoria contumaciæ affinium, injuriæ ut rebar medicorum, minæ potentis" (*i. e.* of Count Barbiani, who no doubt had borrowed money of Fazio) "desperatio salutis, nullus amicus. Quiescens indigebam necessariis, laborare non poteram: mendicare turpissimum erat." On the same pages will be found authority for the succeeding facts.

[3] De Vitâ Propr. p. 18.

for a long time to consider that the life of Cardan was already near its close. He was thus seriously ill for seven months, wanting necessaries. Nevertheless, by the intercession, he tells us, of the Blessed Virgin—perhaps through abstinence from medicine, for he took none; perhaps, he hints, because he was reserved for better things—Jerome recovered. There were many years to come through which a busy philosophic mind had work to do in the unwholesome chamber of his body. The spirit would have been more healthy had it dwelt in wholesome flesh. In more than one place we are told by Cardan that his mind suffered at times pain so intense that he was glad to relieve it by applying counter-irritation to his body. He would beat his thighs with a switch, bite his left arm, pinch tender bits of skin, would fast, and endeavour by such means to produce a flow of tears, for he was relieved greatly by weeping, but was frequently unable to obtain for himself that method of relief[1].

The appearance of Cardan in his manhood well accorded with the temper of his mind[2]. He had thin arms and unequal hands, the left hand being elegantly formed with shapely nails, the right hand clumsy and ill-shapen. His forehead was broad, and there was little hair upon the temples; in later and graver years he wore a skull-cap on

[1] De Vitâ Propr. cap. vi. p. 30; cap. xiv. pp. 65, 66.

[2] Ibid. cap. v. p. 24; cap. xxi. pp. 84, 85, for the next statements.

a shaven head. His beard was yellow and forked. His gait was clumsy, for he paid little or no heed in walking to the way that lay before him, and his pace and bearing varied with his thoughts. It was now fast, now slow, now upright, now with bowed head, as variable as the gestures of a child. In his speech he was too copious and too deficient in amenity[1]. He was very fond of fishing[2]. He had a taste for cats and dogs and little birds, so that he even names them with history, music, and other things that adorn this transitory scene, placing them in his list between liberty and temperance on the one side, and on the other side the consolation of death, and the equal ebb of time over the happy and the wretched[3]. Among his follies he numbers an inability to part with living things that have been established once under his roof. "I retain," he says, "domestics that are not only useless to me, but that I am told also are a scandal to my house; I keep even animals which I have once accepted, goats, lambs, hares, rabbits, storks, so that they pollute me the whole house[4]."

A more natural taste in a philosopher, an extravagant

[1] De Vitâ Propr. p. 59. [2] Ibid. p. 80.

[3] He speaks of quicquam boni quo adornes hanc scenam, and gives for example "musicæ auditus, oculorum lustratio, sermones, fabulæ, historiæ, *libertas, continentia*, aviculæ, catuli, feles, *consolatio mortis, communis temporis transitus miseris æqualis ac beatis, casuum et fortunæ.*" De Propriâ Vitâ Lib. cap. xxx.

[4] De Propriâ Vitâ Lib. cap. xiii. pp. 60, 61.

taste for the purchase of books, can scarcely be named as a peculiarity[1]. More characteristic, in the same way, of the philosopher whose ruling passion was an eagerness for everlasting fame, was a delight in expensive writing materials, a desire to lavish money on the instruments by use of which his name was to be made immortal[2]. A personal peculiarity which lasted for about two years while he was at Sacco, Jerome regarded as a portent. His skin exhaled a strong odour of sulphur[3]. As a practitioner of medicine, Cardan, very wisely indeed, considering the science of the time, trusted more to experiment and observation than to his own wisdom or the knowledge of his art. As a philosopher, apart from dice and cards, he professed and felt tender regard for time, the economy of which he recommended by some such proverb as that many mouthfuls make a bellyful[4]. Not only when professedly at work, but also when riding, walking, eating, or awake in bed, there were analyses and distillations going on within the laboratory of his brain. He considered it a good and wise thing to court the acquaintance of old men, and to seek knowledge in their society. He also, in a spirit of the truest philosophy, considered it

[1] "Profusus in emendis libris." De Vit. Propr. cap. xxv. p. 94.

[2] De Vit. Propr. cap. xviii. p. 80.

[3] De Rerum Varietate (ed. Basil. 1557), Lib. viii. cap. 43, p. 316.

[4] "Multa modica faciunt unum satis." De Vit. Propr. cap. xxiii. p. 90. All that is stated in this paragraph depends for authority on the same chapter in the Liber de Vitâ Propriâ.

his duty to observe everything, and suppose nothing to have been fortuitously made by nature—"by which means," he hints, and we can readily believe, "I have become richer in knowledge than in money."

Recovered from his wasting illness, writing, trifling, and enjoying again his position in the little town of Sacco, when he had completed his thirtieth year, towards the end of the year 1531[1], the young physician married. Before the event, he tells us[2], looking back to it from a later date, and colouring his narrative with superstition, before the event a quiet dog howled with unusual pertinacity; ravens sat upon the house-top and croaked more than they were wont; bundles of sticks broken by a boy emitted sparks of fire.

At that time Cardan, newly and suddenly[3] relieved from the sense of incompetence to marry by which he had for ten years considered himself doomed to remain single, dreamed of a lovely maiden dressed in white. His

[1] De Vit. Propr. p. 19.

[2] De Vit. Propr. cap. xli. pp. 209, 210.—"Cum anno MDXXXI. canis modesta ulularet præter consuetudinem assiduè: corvi insiderent domus vertici crocitantes præter solitum, puer cum fasciculos lignorum frangeret, erumpebant ignis scintillæ, duxi uxorem inexpectato."

[3] "Mirum dictu," he says (de Lib. Prop. Lib. ult.) "ut fiatim è galli naceo factus sim gallus, et ex θλασίᾳ κήλων." All this part of Cardan's experience is the theme of a distinct chapter of the second book De Ut. ex Adv. Cap. beginning at p. 280 of the edition before cited. In it he relates with surprising candour various facts belonging to his student life, especially to the year of his rectorship.

sick mind coloured the memory of his dream in later and more miserable years; the shadow of his future life is therefore thrown over the telling of it. Jerome Cardan dreamed[1] that he was walking in a lovely paradise, fanned by a soft breeze, through scenes such as not Pulci himself could represent by words. It seemed to him, that as he came by the garden porch, he noticed that the gate had been left open. Then looking through the open gateway he saw standing beyond the porch a damsel dressed in white, and he went out to her and put his arms about her neck and kissed her. But after his first kiss there came the gardener, who shut the gate, and would for no persuasion open it again. Then Jerome hung upon the damsel's neck, outside the locked door of his paradise.

Now it happened that not long after this dream a fire took place in the house of an inhabitant of Sacco, Aldobello Bandarini[2], captain of the Venetian levies in the district of Padua. Cardan, who scarcely knew this man by sight, felt somewhat annoyed when, after he had been burnt out of his own home, he established himself next door to the philosopher, and vexed him with the constant passing to and fro of a rough set of visitors. Aldobello was a man who had created friends and fortune for himself in a shrewd, genial way. Jerome was learning to en-

[1] De Vitâ Prop. cap. xxvi. pp. 96, 97. De Libr. Propr. Liber ultim. Opera, Tom. i. p. 97.

[2] De Vit. Prop. p. 97.

dure his neighbourhood, when after a very few days he saw from the road a girl standing at the captain's window dressed in white—a girl perfectly resembling her of whom he recently had dreamed[1]. What was the girl to him? he reasoned. How can I marry a girl who is poor, when I myself am poor? How can I bear to be crushed under the weight of her brothers, sisters, and relations, when I barely know how to support my own existence? Abduction or seduction are not to be thought of (they were unhappily thoughts only too ready to arise in men who admired women three centuries ago), because her father is a captain who would bear no wrong, and lives next door to me, handy for vengeance. O miserable man, what can I do?

It is most probable that Cardan did connect Lucia Bandarini, the damsel whom he first saw dressed in white, with some dream of a white-robed girl that he regarded as an omen, for he was deeply imbued with all the superstitions that had credit in his age. The dream and the desire for marriage were both most likely begotten of his newly-acquired sense of power. He became eager to

[1] De Vit. Prop. p. 97. "Verum dicebam, quid mihi cum hac puellâ? Si uxorem ducere voluero pauper nihil habentem et fratrum ac sororum multitudine oppressam, perii, cum vix vel sic sumptum sustinere queam; si tentem abducere, aut occultè eam opprimere, cum ipse sit oppidanus, non deerunt exploratores, Tribunus Militum non injuriam patietur, et in utroque casu quid mihi agendum erit? O miser . . ."

marry Lucia, and by his eagerness greatly surprised the captain, who at first believed his offer to be made in jest, knowing what chances of marriage he had up to that time steadily refused[1]. The offer was, however, no jest, and the willing maiden was led to the altar by a willing man[2], who afterwards, during the short time that he remained in Sacco, received all the aid and kindness that her parents could bestow upon him. The dog had howled, the dream had warned, but Jerome Cardan took a wife home notwithstanding.

[1] De Lib. Prop. Lib. ult. Opera, Tom. i. p. 97.
[2] "Duco volentem volens." Ibid. p. 98.

CHAPTER VI.

WORK OF THE BRAIN.

MEDICINE, during the last hundred years, has been developing with energy among the sciences, and marking, by an ample ring of newly-acquired knowledge, each year's growth. The study of it may be compared now to a tree planted on congenial soil, for its roots are imbedded in a fair amount of ascertained truth concerning the principles upon which nature acts. When there was no true natural philosophy, there could be no true science of medicine. Medicine was then an art, in which there was awakened no inherent power of development. Diseases are so various in kind, and those of the same kind so various in aspect, that the best empiric, with no thread of principle to follow, is a man lost in a labyrinth. Before anything like a correct knowledge of the ways of nature had supplied the clue, it was in the choice of the physician either to treat his patients in accordance with some theory deduced from the false data furnished by an unsubstantial philosophy, or to argue wholly, as well as he could, from

experience. In the time of Cardan it showed sound discretion in the doctor when he could say as Cardan said, "I have been more aided by experience than by my own wisdom, or by faith in the power of my art[1]." At that time the empiric really was the best physician, and a quack doctor, who would use his eyes with conscientious shrewdness, dealt less death—not to say more health—about him, than the graduate who put trust in scholastic theories.

It was just in those days that the sap began to rise in the philosophy which had put forth leaves once only, and but for that single brief show of vitality had remained, to all appearance, without any change where it was first established by Hippocrates. The science of medicine, for the reason before stated, makes more progress in one month of the present year than it was able to make among all the generations that succeeded each other in the world between the time of the birth of Hippocrates and the publication of the writings of Cardan. During that great interval of twenty centuries there was born only one man, Galen, who did much to advance medical knowledge; and so little had otherwise been gained by the accumulation of experience, that when Cardan began to write, Hippocrates and Galen were the undisputed teachers of all that was held to be sound practice in

[1] De Vitâ Prop. cap. xxv.

medicine and surgery. Nothing was at the fingers' ends of doctors that was not found in the tomes of those two ancient worthies, if we except the dust and cobwebs of scholastic theories that had collected on their surface in the lapse of time. There were indeed other writers whom physicians studied, Oribasius, Aëtius, Paulus Ægineta; among the Arabs, Avicenna, and Averroes, Rhases, and others. But these, so far as they were trustworthy, were little more than cups filled from the pure spring of Hippocrates, or the broad pool of Galen. As for the Romans, they had no physicians of their own worth following. Celsus was only useful—and in that sense very useful—to physicians of Europe in the sixteenth century, as a repertory of medical Latin, which enabled them to write their treatises correctly, and apply to diseases and remedies of which they read in Greek, the proper Latin names in their own volumes.

It was in the lifetime of Cardan that the sap began to find its way into the barren stems of many sciences. The spirit of inquiry that begot the reformation was apparent also in the fields and woods, and by the sick beds of the people. Out of the midst of the inert mass of philosophers that formed the Catholic majority in science, there came not a small number of independent men who boldly scrutinised the wisdom of the past, and diligently sought new indications for the future. Cardan was one

of these; perhaps the cleverest, but not the best of them. Though he worked for the future, he was not before his time. It was said after his death, probably with truth, that no other man of his day could have left behind him works showing an intimate acquaintance with so many subjects[1]. He was one of the few men who can be at once versatile and profound. He sounded new depths in a great many sciences, brought wit into the service of the dullest themes, dashed wonderful episodes into abstruse treatises upon arithmetic, and left behind him in his writings proofs of a wider knowledge and a more brilliant genius than usually went in those days to the making of a scholar's reputation. Jerome, however, had not a whole mind, and the sick part of him mingled its promptings with the sound in all his writings. To any one now reading through the great pile of his works, the intellect of the uneasy philosopher might readily suggest the image of a magnificent moth half-released from the state

[1] A Milanese physician, writing of the Milanese College—the same that had once persecuted Cardan—not very long after Cardan's death, scarcely exaggerated the opinion then held in speaking of him: "Tanquam ad omne scientiarum genus natus, inter omnes sui et antiqui temporis profitentes medicos eminentissimus, verum Medicinæ lumen." Joan. Bapt. Silvatico, Liber de Coll. Mediol. Med. (1607) cap. xx. Naudæus is still more emphatic, and considers Cardan to have excelled Aristotle in variety and depth of knowledge. Cardan himself (living before Dr. Johnson's time) was not ashamed to boast that he had written more than he had read, and that he had taught more than he had learnt.

of chrysalis, its head and feet and front wings working out towards free space and upper air, but all the rest bound by some morbid adhesion to its dusky shell.

The publications issued by a scholar form, of course, so many chapters in his life, but anything like a full discussion of the writings of Cardan, which, in the collected edition, fill ten densely printed folios with matter that is almost everywhere curious and interesting, would occupy more space than could be allowed to it in this biography. I shall condense, therefore, into the present chapter what I wish to say about his early works, including everything written previous to his marriage. Up to that time nothing had been printed. In speaking of these, and afterwards in speaking of maturer, better works, I shall endeavour to dwell only upon those points which elucidate his character, or stand out as facts that belong fairly to the story of his life. Since the great triumphs of Jerome's genius were not achieved in boyhood or in youth, it is not necessary to say very much about those first fruits of his intellect to which this chapter is devoted.

They have been named already. The treatises, written almost in boyhood, on the Earning of Immortality, and upon the True Distances of Objects, do not remain to us. Cardan himself tells us "they were juvenile attempts, and rather signs of disposition than the fruits

of knowledge or of study[1]." The early treatise upon gambling, written in Italian, is represented by a Latin disquisition, published at a later date, on dice and cards[2]. This is recast from the early work, and has few traces of maturity about it It contains much curious minute information about the games played in those days, and the tricks of gamblers, good to be consulted by all writers on the history of such amusements. The book is, at the same time, very characteristic of the writer's temper. Gambler himself, and writing in that avowed character a treatise on his favourite amusement, Jerome takes no pains to defend his reputation, or to justify a love of dice. He lays it down coolly and philosophically, as one of his first axioms, that dice and cards ought to be played for money, since if there be no stake to win there is nothing to mitigate the fact that time is to be lost[3]. To play at dice and cards for amusement purely, he says, when there are books, music, conversation, and so many wiser and better ways of passing time agreeably, is the part only

[1] De Libris Propriis Liber ultimus. Opera, Tom i p 97 "Fuerant enim conatus juveniles et indolis potius indicia, quam fructus scientiæ aut studiorum."

[2] De Libris Propriis (1557), p. 11.

[3] "Impositus est tamen modus, circa pecuniæ quantitatem, alias certe nunquam ludere licet quod quam sumunt excusationem de leniendo tædio temporis, utilius id fiat lectionibus lepidis, aut narrationibus fabularum vel historiarum, vel artificiis quibusdam pulchris nec laboriosis, inter quæ etiam lyra, vel cheli pulsare, aut canere, carminaque componere, utilius fuerit. . . Lib. de Ludo Aleæ, cap ii.

of an empty man. Dice and card-playing in a house set a bad example to children and servants; and people who are very respectable, says Jerome, ought not to be seen at the gambling-table. To take part in games of chance sullies also especially the dignity of a physician[1].

There is more than ordinary candour in this way of opening the subject, and in the recommendation that decent people should gamble in private, and then only with their equals in position and in wealth[1]. There is a chapter occupied in the setting forth, as upon a balance-sheet, of the good and bad sides of the dice-player's experience[2]. In his favour, it is said:—At the gaming-table he forgets his cares, and can return from it with a prompt spirit to the work over which his mind may happen to have flagged. There, also, his friends open their souls to him unwittingly, their passions and propensities break out over the changes of the game, and he can see them and discriminate between them as they are. The gaming-table also is, for the time, as true a leveller as death; over it men have hailed princes as companions, acquired their favour, and obtained promotion in the state. Cardan himself did in this way become acquainted with a prince[3]. Then, however, turning to the dark side of the picture, the philosopher dilates upon the great preponderance of

[1] Liber de Ludo Aleæ, cap. iii. [2] Ibid. cap. iv.

[3] "Quo etiam Francisco Sfortiæ Mediolani principi innotui et nobilium amicitiam multorum mihi comparavi." De Vit. Propr. cap. xiii. p. 69.

evil that he finds, and sums up by saying that he writes a treatise upon gambling, though it is a bad thing, because it had become (as, indeed, in those days it almost had become upon all ground much afflicted by the tread of armies) universal and, as it were, natural to man. He writes of it, therefore, as a physician writes of an incurable disease, not praising it, but showing how to make the best of the affliction[1].

Then arises a discussion of the furniture of dice-playing —namely, the tables, and the bone marked upon four sides, or the cube marked upon six. Then follows a chapter upon the casting with one, two, and three dice, pointing out probabilities. The rest of the treatise includes a consideration of the morals of dice and the rules of honour among gamblers, as, says Cardan, there are laws also among thieves[2]. It contains also an account of all games played with French, Spanish, German, and Italian cards, including a description of the cards then commonly in use. Cheating appears to have been more common, as it was more easy, with cards than with dice. Among the tricks that are exposed is one that consisted

[1] "Etsi tota Alea mala esset cum tamen ob ludentium multitudinem quasi naturalis sit; ob id etiam velut de insanabilibus morbis a Medico tractandum fuit; namque in omne malo est minimum malum, in omni dedeco minimum dedecus, in omni flagitio minimum flagitium." Lib. de Ludo Aleæ, cap. v.

[2] "Sunt enim in malis rebus suæ leges; velut et latronum et piratorum." Ibid. cap. xxix.

in soaping the back of some important card, so that the others should slip from it when it was thrown down among them. Thomas Lezun, a Venetian patrician, used to cheat Cardan with soaped cards. We may suppose that when a trick of that kind could be practised the cards used were not particularly clean. Nor should we connect with them any associations drawn from the modern whist-table: in most games played in the time of Cardan, cards were used only as paper-dice. This treatise closes with a little chapter upon the use of dice among the ancients.

Of the works already named as having been written by Jerome during the six or seven years of his life in Sacco, there remain two, both of which underwent at a later period of their author's life a great deal of revision. One of them is the little treatise upon Cheiromancy, which afterwards was published as a chapter in a philosophic work of great extent, the labour of maturer years. In his maturest years, however, Cardan never escaped from the hold of superstition. Stars and dreams were always portents to him, and he never ceased to believe that there was a portentous science to be studied on the palm of a man's hand. The hand, he said, is the instrument of the body, as the tongue is of the mind[1]. He therefore studied

[1] De Rerum Varietate Libri xvii. (Basil. 1557) Lib. xv. cap. lxxix. p. 557.

all that he found written upon Cheiromancy, and his treatise on the subject is no more than a dull abstract of his studies. He gives, for example, a woodcut-picture of an outspread hand, with the name of each part inscribed on it, according to the Cheiromantic nomenclature. Above the joint of the hand at the wrist there is the carpus[1]. The side of the hand against which the thumb rests is the thenar. The other side, between the little finger and the wrist, is called the hypothenar. The ball of the thumb is entitled stethos. The joints of each finger from the hand upwards are called procondyle, condyle, and metacondyle. Then there is assigned to each finger a planet, Cheiromancy being, in fact, a sister science with Astrology. The thumb and stethos belong to Mars: on them we read of violence or strength, of fire or hostile accidents in life; there also we read of rough attachments, similar to that which inclined Mars to Venus. It is a curious fact to note how intimately a belief in the old heathen mythology was blended with those pseudo-sciences, astrology and cheiromancy, and in that form could be fostered even by grave Christians and dignitaries of the Church of Rome. The index finger belongs to Jove: upon it we read of priesthood, honours, magistracy. Middle fingers are all subject to Saturn: Saturn writes on them dark hints of prisons, fevers, poisons, fear,

[1] De Rer. Variet. pp. 558—564.

grief, profound meditation, occult studies, toil without reward. The ring finger is the Sun's: on it we read of high honour, power, and the favour of kings. Venus holds man by the little finger: upon it she writes of wives and sons and other pleasant things that suit her humour. The Moon rules over the hypothenar: upon that she tells of shipwrecks, suffocations, and submersions. In the next place, concerning lines, the line within the hand, bounding the ball of the thumb, is the line of life, of the heart, and of the sun. The line across the middle of the hand is the line of the brain and of the moon. There is a line running sometimes from the carpus to the middle finger, called the sister to the line of life, and they who have it lead lives full of labour and pain. It would be weary work to multiply the details of so dull a science. Very few more words upon it will suffice.

They who are to die early have the lines upon their hands indistinct and intersected in a great many places. They will be happiest whose lines are deep, and coloured, and straight in their course, or running into such regular forms as stars, crosses, squares, or parallels. New lines found tending to the right mean new successes, those that incline to the left forebode reverses. Fine lines like hairs denote bad luck. This science also takes great notice of the nails, drawing conclusions from the number

and the colour of the spots upon them. All these things, throughout his life, Cardan, a great philosopher, religiously believed[1].

He was not daunted by this problem: In children on account of the softness of the skin, and in old age on account of its dryness, lines are most abundant. How then can lines denote the course of life when they abound most in the people who do nothing? To this objection Jerome was content to give the answer properly appointed to be given by the teachers of the Cheiromantic creed[2]. In children the lines signify the future, in old men they signify the past; in each they tell of a whole life. In the mature hand, also, it is convenient to know that there are

[1] After speaking of some of the doctrines of Bodinus, who was born thirty years later than Cardan, Dugald Stewart says: "Notwithstanding these wise and enlightened maxims, it must be owned, on the other hand, that Bodin has indulged himself in various speculations, which would expose a writer of the present times to the imputation of insanity. . . . In contemplating the characters of the eminent persons who appeared about this era, nothing is more interesting and instructive than to remark the astonishing combination in the same minds of the highest intellectual endowments with the most deplorable aberrations of the understanding; and even, in numberless instances, with the most childish superstitions of the multitude." Encyclopædia Britannica. Eighth edition. Vol. i. pp. 28, 29. The life and writings of Cardan are an emphatic illustration of this fact. Speaking very roughly, we may even say that where Cardan was thought mad by his neighbours, we should think him wise; and where his neighbours thought him wise, we think him mad.

[2] De Rer. Variet. p. 561.

many lines, commonly ill-defined—as if vanishing—that tell of past events.

The work next to be mentioned shows the intellect of the superstitious philosopher from a better point of view. It is the treatise on the Differing of Doctors.

Many things in the writings of Cardan make it evident that he had studied Galen to good purpose, and it is not unlikely that it pleased him secretly to feel that he himself resembled Galen in a good many particulars. Hippocrates stood on his own pedestal, and was a great man by himself. The old father of Medicine, contemporary with the wisest men of Greece—younger than Socrates, but at the same time an older man than Plato—merited his crown of gold from the Athenians and his dinner in the Prytaneium, for he was morally and intellectually great. He wrote simply, tersely, royally as a king issuing wealth from his own mint, not as a rich man pouring out his hoard of coins, with all manner of kings' heads and dates upon them. He was a fearless old fellow who would not move one step for the enemies of Greece. He was a true-hearted physician, who gathered men about him in a grand spirit of kindliness. He visited the poor without reward, loved knowledge for its own sake, bound his disciples by a vow to mutual courtesy, to a religious keeping of all secrets trusted by sick people to their

charge, and enforced with all his might a code of practice that became a noble calling. To the end of the world, physicians will appreciate their fine-hearted old father, and be proud to think themselves the children of Hippocrates. But Galen was a man of smaller stature, living at a time when it was not so easy to be noble. He was physician to five Roman emperors, and one of them was Commodus. He commented upon Hippocrates, and wrote much; not in the clear, royal style, but with diffuseness. Like Cardan, Galen had a passionate mother; like Cardan, he was persecuted, for he could with difficulty keep his ground in Rome against the sects in medicine whose theories he laboured to demolish; and the parallel holds good, though Galen became great in his day, and was sought by kings. Like Cardan, again, Galen was deficient in personal courage, and superstitious, having much belief in dreams and omens. Galen and Cardan were both boasters, and both men who really rose above the level of the intellect around them. Galen fought against the mere scholastic sects into which the doctors had degenerated and divided, the dogmatics, the empirics, the methodics, the episynthetics, the pneumatics, the eclectics, and especially attacked them in a lost book, of which the title is preserved, De Empiricorum Contradictis, the Differings of the Empirics. Cardan found the physicians in his day straying

away from the truth, and losing the best sense of the teaching of Hippocrates, as Galen had restored and amplified it. The first attempt, therefore, of Cardan, as a medical author, made in direct imitation of Galen, was a work entitled Contradicentia Medicorum, on that wide subject the Differings of Doctors. The titles of some other of Cardan's works are borrowed from the example of Galen. The list of resemblances is scarcely made complete, when I add that the style of Galen, brilliant, pompous, and diffuse, would not pair badly with the style of Cardan, though Cardan, equally diffuse, wrote with less rhetoric and more true genius. Galen was also a prominent example of prolific authorship, Cardan himself being no mean proficient in the art of bookmaking. In that respect, however, he was utterly eclipsed by the sage of Pergamus, since it is said of Galen that he wrote seven hundred and fifty books; five hundred on medicine, and the rest on geometry, philosophy, logic, and grammar. Galen wrote two treatises especially upon the books that he had written, and the order in which they were to be taken. Those treatises he called "De Libris Propriis." Cardan wrote three works of precisely the same kind, and gave them the same title.

While noting facts like these, it is to be remembered that the imitation of old forms was, in Jerome's time, the highest object of a great deal of the scholarship of Europe, and that Cardan shared many points of the preceding

parallel with a large body of the teachers in his day. He differed from the herd of doctors, however, very greatly, inasmuch as he poured into the old jars not dregs collected from all quarters, but fresh oil of his own pressing. His first work, the Contradicentia Medicorum, was very much expanded afterwards, and published as a massive treatise, of which it will be requisite to speak in a succeeding chapter. It will be quite sufficient, therefore, now to state the plan of it, since that was conceived even in its author's days of pupilage. Hippocrates, said Cardan[1], had become obscure through lapse of time and the conciseness of his style. Galen—"of whom there remains less than we could wish, but more than we could well believe it possible for one man to have written"—Galen, in works written at different periods, contradicted himself much and often. By the Arabians all his errors had been copied. Aëtius was inconsistent, following at once both Galen and the men whom Galen combated, and never giving reasons for his dicta. Oribasius was useless. In fact, there was only Galen, with his errors and his obsolete passages, upon whom a hope of useful information could be built. His design, therefore, was to travel steadily through the medical doctrines of Hippocrates and Galen, to note all contradictions of themselves or of each other, and to consult with the same view the works of all the

[1] Contradic. Medicorum. In preface.

leading medical authorities. Then he proposed to present to the medical world of his own day, in a series of paragraphs, all the chief points on which conflicting sentiments had been expressed; to cite in each instance the differing opinions, in order that a judgment might more easily be formed as to the balance of authority. He himself always undertook to hazard a decision, testing the judgment not only of the Prince of Physicians, but of others; in every case following, as his guide, Reason rather than Authority. He would confirm or dispute past opinions, and not shrink from the addition to them, now and then, of views more properly his own. The reader was thus also to be left fully provided with the materials required for independent judgment. The value of a work of this kind, really well done, would of course be great, and many sheets had been written in prosecution of the plan when Jerome took a wife at Sacco.

CHAPTER VII.

THE STORY OF ALDOBELLO BANDARINI—ILLS OF FORTUNE—OF THE PORTENT THAT AFFLICTED CARDAN AT THE BAPTISM OF HIS ELDEST SON—HUNGER IN GALLARATE—POVERTY IN MILAN.

JEROME CARDAN duly reflected before marriage upon the dead weight of his wife's relations, that might, perhaps, form not one of the lightest burdens of the married state. Lucia was the eldest of four sisters, and she had three brothers, all sons and daughters of Aldobello Bandarini and his wife Thaddæa[1]. At the time of the marriage, however, it was much more likely that Jerome would depend now and then for help upon the Bandarini family, than that the Bandarini should need—or, if needing, ever be able to get—help from him. Aldobello, the father-in-law, was a man in the prime of life, genial and shrewd, a man who knew not only how to win to himself friends, but also how to use them profitably. A full sketch of his career is left to us by Cardan, who, speaking

[1] The succeeding sketch of the career of Aldobello follows the very full narrative given by Cardan in De Ut. ex Adv. Cap. Lib. iii. pp. 457—466.

rather as a philosopher than as a son-in-law, begins his story very much in the manner of a physician of the present day who has a case to state, and defines his subject as—"Aldobello dei Bandarini, of the town of Sacco, aged about thirty-five, hairy over his whole body, short, round limbed, and of a dusky colour," &c. This man began life as a soldier, and made a little money in the wars—that is to say, being of an acquisitive disposition, he had laid by three or four hundred crowns of gold. Retiring then from military life, he built an inn at Sacco, and dwelt in it with his wife Thaddæa and his seven children. Mine host soon made himself known in Sacco as a sociable, friendly fellow. In his domestic management he was a strict economist: nothing was in his eyes too small to be saved. He bought in times of cheapness stores that he laid by to sell in times of dearth; he paid cash for his purchases when he could obtain any advantage by so doing, and wherever it was gain to him to run a bill up and allow it to remain unpaid for a time, so he did. He not only received guests as an innkeeper, but also provided dinners and suppers for private parties in the town; at such entertainments, whatever was to be consumed he sold; whatever was to be looked at only, he let out on hire; what he himself did not possess, if it was required he would contrive to borrow and sub-lend. To the great men of the town he was indispensable: whether they

feasted or gambled, there was the friendly, jovial Bandarini ready to supply their wants; and so much did he ingratiate himself among them, that even clothes and worthier gifts were often pressed upon him by his noble friends. Still more complete, however, was the hold which the bland soldier-host maintained upon the goodwill of the gentle sex. He often busied himself in defending the causes of accused people before the magistrates, in obtaining by his influence exemption from some public burden for one friend or another, and for such services the gratitude of the women streamed upon him in a shower of substantial gifts, which he accepted without difficulty. Kind messages were constantly accompanying to his door consignments of wine, meal, geese, chickens, pigeons, barley, pigs, or cheese, so that he could almost have kept his family upon the goodwill-offerings supplied by his fair neighbours.

At one time, in the hope of making profit from it, Aldobello had, among other things, stored up a considerable heap of flax. To this heap, Mark, his eldest boy, by accident set fire; the inn was burnt, and with it all the wealth of its bland master. Bandarini, without showing any anger, bit his nail; he did not so much as utter a curse, but thanked God that his children were all safe. After the fire was out, he searched for any little things that might possibly be snatched out of the wreck; friends

also flocked to him with presents in their hands, and hospitable homes provided bed and board for all his children. There was no capital wherewith to build another inn, but there was worldly wit in ample store, and Aldobello set to work at once over the rebuilding of his fortunes.

The Duke of Ferrara was then contemplating the occupation of a part of the territory of Padua called the Polesino de Rovigo. To the senators of the Republic of Venice an offer was made by a good citizen, who undertook to aid in the protection of the commonwealth by training gratuitously two hundred men belonging to the town and neighbourhood of Sacco in the art of war. The citizen asked only that the senate would, if it accepted his proposal, grant two hundred harquebuses to the two hundred volunteers. The rumour of war was loud, the enemy was near at hand, and there were no fortresses to check his progress if he made hostile advance. The offer was opportune ; the proposer of it, a certain Aldobello Bandarini, had seen service as a soldier, and he had many friends of mark who offered to be surety for his loyalty, lauded his character, and urged his suit. He did not ask pay for his services in drilling the recruits ; the cost of harquebuses would be inconsiderable. The burnt-out innkeeper therefore obtained the authority of the senate to levy in his own neighbourhood two hundred recruits.

It was easy to find that number of rustics, or even of friends in better circumstances, glad to go out to drill with Aldobello, and to earn the legal right of carrying about the harquebuses sent from Venice. Aldobello set to work upon his little army. Bearing some ridicule at first, by diligent devotion of spare hours and holidays to the forming of lines, squares, and wedges, he had in a month or two made very obvious progress towards the formation of a troop reasonably disciplined. The volunteers of Sacco bought for themselves drums, and furthermore set up a flag. Doubtless they would also have done deeds of daring in the presence of the enemy, but most unluckily for them the murmurs of approaching war subsided.

If there was no money to be made out of the Venetian republic as captain of a band in actual camp service, the prudent Aldobello saw that he was altogether in a false position; he must make a further move towards the restoration of his fortunes. He therefore went to Venice, and having demonstrated the usefulness of the labour in which he had been engaged, petitioned that the senate would permit him to go out with his two hundred men as mercenaries, hiring their services to foreign princes, but always bound and ready at a call to return and do whatever duty was required for the Venetians. To make this request, he said, he was compelled by poverty, not urged

by avarice. Then there arose again the cloud of friends who trumpeted his value; and the senate being led justly to believe that the petitioner was a servant whose departure would inflict a loss upon the state, Bandarini was requested to remain in Sacco, and to receive payment for his labours with a monthly stipend. Immunities were also granted to his soldiers, and the world of the shrewd soldier-host began to brighten.

But at that stage of his progress enmities arose against him. Some jealous men detested the activity with which he pushed his fortunes; many were annoyed at him for taking labourers from steady tillage of the soil, marching them about to sound of drum in squares and wedges, and infecting them with military airs. Again, there was the sister of an important personage in Sacco deeply enamoured of the gallant captain, and she, by her misplaced tenderness, brought down upon his head the wrath of her relations. A tide of accusations suddenly set in towards Venice. The accusers, evidently knowing his weak point, complained to the senate that Aldobello Bandarini had employed the vantage-ground of his position for the extortion of substantial gifts and money from the people; that he was designing also to sell the harquebuses entrusted to him for the use of his troop, and to decamp with the money so obtained. Complaints of this kind were urged so strenuously, that they led to the

arrest of Aldobello, who was carried off one day in chains.

Again he was enveloped in the cloud of friends, and his exculpation was by them and by himself made so complete, that he came back to his own neighbourhood taller than ever. He was supplied with three hundred more harquebuses, and authorised to raise three hundred more recruits from volunteers in and about Sacco. He thus became a captain of five hundred; and so well did he perform his work with these, so earnestly did he enforce the extended adoption of his plan in other districts, that in no very long time Aldobello Bandarini was able to boast that he had been the founder of a complete militia system spread over the whole territory of Venice, and adopted from the Venetian pattern in adjacent and even in some distant states. He himself enjoyed the post of Tribune of the Militia, and a threefold increase of his monthly pay.

Having attained this point in his career, he was again burnt out of his abode, by the fire to which reference has been made in a preceding chapter. The business of the tribunate required a large house, and one night a boy asleep in a weaver's shop belonging to the premises upset a pan of burning charcoal with his foot. A conflagration was the consequence, destroying the whole house, and for a long time threatening to devour also the houses

in the neighbourhood. At this fire Cardan was present; out of it the members of the tribune's family were rescued with much difficulty, not indeed without some shock to the modesty of the youngest daughter. Lucia was the eldest of the daughters, and may then, perhaps, have been first seen by her future husband. An impression, otherwise fleeting, then made upon Jerome, may have been revived subsequently in his vision of the white-robed maiden who invited him to pass beyond the gates of paradise. Dream-figures are, however, unsubstantial, and resemblances between them and the daylight aspects of real flesh and blood are matters rather for the fancy than the judgment to lay stress upon.

By the second fire, the tribune of course was not ruined. His friends again came forward. Houses were again open for the reception of his children while he established himself in new premises, next door to the dwelling of the young physician and philosopher. Representations made at Venice procured from the senate a liberal order that Aldobello should be compensated for his loss by an immediate grant of six months' pay. Very soon afterwards his new neighbour, the doctor, courted Lucia, and the tribune, whose career in Sacco just narrated had all been comprised in the short space of seven years, consented to the wedding.

Marriage is, in a poor philosopher, a bold act. Jerome,

when he married the young girl[1] Lucia Bandarini, was extremely poor, yet because he had made a vow upon the subject, he refused to take with her the customary dowry[2]. He was very poor, and there was no hope that in Sacco he would ever become richer, for Sacco was but a small town, and could ill support a doctor of medicine, even though he were dull, bland, and formal enough to impress everybody with a notion of his talent and respectability. Jerome had friends at Sacco, but he had spent all his available substance in their company, and since, in spite of the ravens on his house-top and the howling dog under his window, he had taken upon himself the responsibilities of marriage, it was necessary that he should obtain an income upon which the expenses that would certainly ensue could be supported.

In what town should he battle for his bread, if not in Milan? There he was at home; there his relations were, litigious and hostile certainly; there his friends ought to be; there only he was not a stranger. The friendship of the physician Buonafide had suggested Sacco to the young Cardan, when the physicians of his own town would not admit him to participation of their privileges. From Sacco he had already made one descent upon the capital, where he sought in vain, as we have seen, to

[1] "Duxi uxorem adolescentulam." De Ut. ex Adv. Capiend. p. 431.
[2] De Ut. ex Adv. Cap. p. 431 and p. 452.

overcome the hostility of the college and secure a footing for himself. He found then also his mother miserable and morose, lamenting her widowhood, and sulking over the discomforts she endured. Fatigue and disappointment brought him on that occasion to the gates of death. After seven months of deadly sickness, he had returned with broken health and broken hopes to Sacco. Now, however, he would try Milan again. The college could not be for ever obdurate, and he might live down the objection to his birth. Very soon after their marriage, therefore, Jerome and his wife, in February, 1532[1], removed to Milan. Jerome was then infirm in health, but his mother, Clara, had become, by that time, prosperous and cheerful[2].

The tribune, however, had expected nothing less than the departure of his son-in-law from Sacco. He submitted to the disappointment he experienced on this account with outward equanimity, but he was deeply grieved at heart. His regard for "the daughter of his good luck" was of a superstitious kind[3]. A few days before she quitted Sacco with her husband, a stone, put upon the fire by accident, cracked with a loud noise, and

[1] De Libris Propr. (ed. 1557) p. 13. "Valetudinarius, pauperque." The date is there misprinted 1533, but the correction is obvious enough.

[2] "In patriam denuo reversus, sospitem matrem inveni." De Consol. p. 75.

[3] De Ut. ex Adv. Cap. p. 452.

scattered fragments over Aldobello's bedroom. Ever afterwards his mind recurred with horror to that evil omen; but ever after was not a long time, for he died before the year was ended. He died with another and a deeper grief upon him, caused by the wicked life of one of his own sons.

Cardan, when he returned to Milan, felt the want of his father-in-law's tact in winning good opinions that could be turned to gold. Still he had no friends, except the few who had become acquainted with his genius—men who knew how the young physician, so excitable, so superstitious, and so often seen indulging in a restless love of dice, spent solitary hours in abstruse study, cherished great thoughts, wrote books out of the pure instinct of the scholar, having no reason to believe that he could ever get them printed, and lived on in the unwavering conviction that he had within him power to secure immortal fame. Still the decorous college of the Milanese physicians shut their gates upon him[1]. He was notoriously excluded from their body, and denied the right of practising legitimately, because he had not been legitimately born. Trouble weighed heavily upon him: poverty, nervous irritation, and the foul air of a town then never entirely free from plague, weakened still more the health of the young husband. His wife,

[1] De Libris Propriis (1557), p. 13.

sharing his cares, miscarried at the third or fourth month, and again a second time miscarried[1]. No bread was to be earned at Milan. After a vain struggle, the newly-married pair determined to go out again into the world.

The anxious question of the choice of a new spot to which they might transfer their struggle with some hope of a good issue was decided by a series of arguments in favour of Gallarate[2]. That is a small town twenty-four miles distant to the north-west from Milan; it does not at this day quite contain four thousand inhabitants. Jerome and Lucia went sick and weary out of the inhospitable capital, and settled in the country town of Gallarate when the trees were bursting into leaf[3]. They would gain, they said, pure air, and that was good for both of them. They would be able to subsist more cheaply, for the country prices differed greatly from the charges set upon provisions in the town, and there were even a few eatable things to be had for nothing. Cardan would be at liberty to practise there unhindered, for he would be beyond the jurisdiction of the hostile college, and he would be impeded by no rivals. Finally, there was one consideration above others which had indeed suggested Gallarate as the

[1] De Libris Propriis. Lib. ult. Opera, Tom. i. p. 98.

[2] These will be found, with other details here cited, in the section de Paupertate of the book de Utilitate ex Adversis Capiendâ, pp. 439, 440. The supposed connexion with the Castellione family is there explained very minutely.

[3] "Circa Aprilis finem." De Vitâ Propr. p. 19.

proper home for a Cardan. The town was within one mile of a castle which the Cardans claimed as an ancestral hall. At Gallarate a Cardan might claim the respect that he was unable to command in Milan. As for the Milanese, the College of Jurisconsults had at first been nearly as hostile to Fazio the father, as the physicians were to Jerome the son, and in the next generation the same spirit was displayed[1]. Now the Cardans claimed to be of the noble blood of the Castellione, who were at home near Gallarate, and in confirmation of their claim pointed to inscriptions upon the prothema of a church known to all the people of that little town. Jerome at first believed this claim to be a true one, and was not unwilling to be called Girolamo Castellione Cardano. He is to be found so named after his death by many writers, but in his lifetime he formally and conscientiously abjured the second name, because he convinced himself that he had no right to bear it[2]. In April, 1533, however, when, towards the end

[1] "Nam et pater meus ut ab eo accepi, diu in ingressu coll. jurisc. laboravit, et ego ut alias testatus sum, bis a medicorum Patavino, toties filius meus natu major, a Ticinensi, uterque a Mediolanensi rejecti sumus." De Lib. Prop. (1557) p. 188.

[2] In the dedication to the revised edition of *De Malo Medendi Usu*. Since the name that he disclaimed is still commonly ascribed to him, it will be well to quote a part of his distinct repudiation of it. "Pudebat me inter reliqua, nimia pietate, patris siquidem verbis persuasus, qui hoc palàm, nescio quo ductus errore, affirmabat, Castilioneum nomen addidisse: cum certum habeam, revolutis omnibus publicis tabulis, majorum meorum, ad annum usque MCCCXL. qui ab hoc, ccvi. est, nihil mihi cum Castillioneis commune esse."

of the month, Jerome settled in Gallarate, by the advice of Giacomo Cardan, his cousin, resident upon the spot, he believed that he had a right there to be honoured, if not for his genius and learning, at least (scrofulous man as he was) for the good composition of his blood.

Pure air improved the health of the philosopher, and cheapness of provisions may have made it possible, by dinners of herbs, to live for a short time without too bitter a sense of want. They watched the gradual departure of the few coins they had mustered when he and Lucia prepared to set out on their venture[1]. Their poverty began to border upon destitution: very few fees came in. Cardan began a treatise upon Fate[1], in which he showed that events frequently happen contrary to human wishes, and that such disappointments must be borne with equanimity. For himself, the knowledge of his strength was in him, and when he sat down at Gallarate to begin this treatise upon Fate—though there was no outward circumstance on which to found a hope that anything proceeding from his pen would ever make its way into a printing-office—his heart leapt out into the opening words concerning "All who hope that, by writing, glory possibly may follow to themselves[2]." At Gallarate he began also for Filippo Archinto, a clever young Milanese patri-

[1] De Libris Propriis (ed. 1557), p. 14.

[2] "Omnes qui scribendo gloriam consequi se posse sperant."

cian, a book on astronomical opinions, and a treatise based upon Agrippa's occult philosophy, in which care was taken to avoid the introduction of fictitious marvels[1].

But Cardan's daily life was tortured by the morbid ingenuity of superstition into a long course of experience in magic. Every sight, sound, or smell that was unusual, was likely to be received as an omen by the credulous philosopher. He believed that he received secret monitions from a genius or guardian spirit[2]—sometimes they came from the spirit of his father. It was not strange to him that, when he contemplated marriage, the dog howled, and ravens shrunk together in his neighbourhood. The shadow of the warning spirit moved about its doors, and the brute animals gave token of the dread excited by its presence[3]. So men's minds are darkened when the shadow of a cloud floats over them, and they are moved against their will to joy or to delusive hope by a fresh outburst of the sun; so can gems also lose their light, and metals lose their lustre. Why, asked Cardan, should he enjoy the favour of especial warnings? Was it because, although hemmed in by poverty, he loved the immeasurable truth, and worshipped wisdom, and sought justice, that the mystic presence taught him to attribute all to the Most

[1] De Sapientiâ, &c. p. 423.
[2] De Vitâ Propriâ, cap. xlvii. More will be said of this hereafter.
[3] Ibid. p. 263.

High? Or did the spirit come for reasons known best to itself? Again, why were its warnings so obscure—why, for example, did it sometimes become manifest by noises that he was unable to interpret? He could not answer these questions, but he believed that the spiritual communications were made wisely, and lost significance by passing through the dull wall of the flesh into a mind not always fitted to receive them[1].

After his twenty-sixth year, Cardan was often troubled by a complaint, common to most men of his organisation, a frequent ringing in the ears. He received this as a supernatural endowment[2]. By the ear in which the sound appeared to be, and by the manner of the sounding, he knew, he said, in what direction and in what way men were talking of him. He believed also that his presence acted as a preventive of all wounds, and that no blood could flow from wounds inflicted in his presence[3]. The former opinion he may have justified by the fact, that in those days of violence he had escaped the sight of bloodshed in the streets; the latter belief he founded on a single circumstance. Since he himself, professionally, opened veins, it was his further belief that in such instances the flow of blood was owing to a special dispensation. Cardan embraced and amplified the whole

[1] De Vitâ Propriâ, cap. xlvii. pp. 264, 265.
[2] Ibid. pp. 178, 179. [3] Ibid. p. 163.

body of the superstition of his age, yet it may be said of him, more truly perhaps than of any one of his contemporaries, that he embraced and amplified also the whole body of its learning.

While struggling unsuccessfully in Gallarate, breathing the fresh country air, and able to satisfy no more than the wants of nature in the simplest way, Jerome's health steadily improved, and Lucia, who did not again disappoint his hopes, gave birth to a son on Thursday, the 14th of May, in the year 1534[1]. The child resembled most its grandfather, for it had small, white, restless eyes, and a round back; it was born also with the third and fourth toes of the left foot joined together, and proved, as it grew, to be deaf in the right ear. It being at first uncertain whether the boy would live, it was baptised on the succeeding Sunday, between eleven and twelve o'clock, by the bedside of its mother, all the household being present, except a famulus. Then, because the day was warm and sunny, they had drawn aside the curtain from before the window, and had thrown the window open to admit the light and air. And at the moment when the child was lifted from the font or basin, chris-

[1] De Libris Propriis (1557), p. 22. "Cum vero parum esset mihi eo eunti, totum tamen illud parum consumptum erat. Sed valitudo restituta, viresque confirmatæ, et filio auctus eram." See for date of the son's birth, and the account of his baptism, De Vitâ Propriâ, cap. xxxvii., and especially the last of the three books De Libris Propriis. Opera, Tom. i. p. 98.

tened by its name of Giovanni Battista, there flew into the room a mighty wasp.

This was portentous, for the wasp was larger than wasps should be at that time of year, nor, reasoned Cardan, do they usually enter houses till July or August. All watched to see the issue of the omen: the anxious father, whose sense of mystery was so fine that he had found something supernatural even in the smell of his own body, perceived that this was not a common wasp. Hurting no one, but alarming all, it flew twice in a circle round the bed, but from its third flight darted back towards the window. There, however, instead of flying out into the open air, it dashed into the curtain, and, becoming entangled, made so loud a noise, "that you would say," writes Cardan, "a drum was being beaten. We ran to it, nothing was found." The portent had vanished; there was no wasp to be seen; and yet we are told that it could not have escaped unnoticed through the window while they were all watching it attentively. It was agreed by the whole party that this wasp was a revelation. All coincided in opinion that the life of Jerome's first son would be short, that he would be garrulous, and that he would be cut off by a sudden death. So much Cardan predicted, and the vital part of the prediction was fulfilled, how terribly no wasp or planet could have taught the father to suspect. If griefs ever send heralds out before them, there was a grief advancing

by slow marches to possess the spirit of Cardan, great enough to be worth announcing by a dozen heralds.

So, declared the victim after the event, it was announced. The dream of the shut gate of the paradise he quitted to embrace a white-robed maiden foreboded no bad wife to him, it pointed to his son[1]. A knowledge of the mighty grief for which the way was opened by his marriage, caused the shadow of the tutelary genius to haunt his doors when he slept for the last time alone at Sacco. So such things were afterwards interpreted. At Gallarate, Jerome, in spite of all warnings, ignorant of the future, and by no lore able to divine the way to larger dinners, wrote much and ate sparingly. He bravely bore his poverty, and knew that he should work his way to fame.

In addition to the writings that have been already mentioned, he was turning into Latin his treatise upon games, and making slow progress with his analysis of the contradictory opinions of the doctors. But he consumed much time in seeking the relief of music for his cares, and relief to his pocket from the dice-board[2], for he was slipping, when his son was born, every week lower down into an abyss of hopeless

[1] "Somnii interpretatio non in puellâ desiit sed in filiis vim suam ostendit." De Vitâ Propr. cap. xxvi. p. 98.

"Annus erat trigesimus tertius exactus, cum ludis et musicâ avum consumpseram, nec intensa quicquam egregii invaseram aut perfeceram. Siquidem libros de Fato et librum Ludo latrunculorum, paulo plus quam inchoaveram." De Libris Prop. Lib. ult. Opera, Tom. i. p. 100

poverty. After his son's birth, he struggled on against adversity for five more months in Gallarate, and at the end of that time gave up his position in the little town, not upon deliberation but compulsion. He and Lucia, in all the nineteen months[1] of their abode at Gallarate, had earned scarcely forty crowns[2]; and when they were at last reduced to absolute destitution, when he had lost at the gaming-table his wife's jewels, even his bed, they, having no other hope, determined on returning into Milan. Not, said Cardan with touching brevity, that there was anything to seek, but that there was something from which to fly[3]. He determined to quit Gallarate and plunge once more into Milan, as a man hemmed in upon a barren rock resolves to cast himself into the sea.

It was in October, 1534[4], that Jerome, with his wife and child, came back to Milan beggared, and applied for shelter to the public Xenodochium[5], the workhouse of his

[1] "Ubi mansi xix. mensibus." De Vitâ Propr. p. 19. He went in April, 1533, and returned to Milan in October, 1534.

[2] De Vit. Propr. cap. xxv. p. 94. De Lib. Propr. Lib. ult. Opera, Tom. i. p. 100.

[3] ". . . . non quòd haberem quod sequerer, sed quod fugerem . . . ." Ibid.

[4] "Quasi e scopulo inaccesso me præcipitaturus in mare, decrevi in patriam redire anno MD.XXXIV, mense Octobris." De Lib. Prop. (1557) p. 23.

[5] Details and references on the subject of the Xenodochia may be found in Zedler's Lexicon (Leipzig. 1749), vol. 60, col. 655—7. They took their name, and some of their spirit, from the Greek institutions dedicated Jovi Xenio. Much of their spirit was, however, purely ecclesiastical; they became sources of income to the clergy.

age. That was an establishment whose doors were open to the sick and needy and the houseless stranger, maintained from religious motives by various communities, in direct obedience to the admonition joined in Scripture to the question of the righteous and unrighteous—"Lord, when saw we thee an hungred and fed thee? or thirsty and gave thee drink? When saw we thee a stranger and took thee in? or naked, and clothed thee?"

Cardan, however, had an active friend in Milan. The same Filippo Archinto[1] for whom he had been writing his book on the Judgments of the Astronomers, had counselled him to come again to Milan, and took pains on his behalf. Filippo, the son of Christopher and Maddalena della Torre, differed in age from Cardan by not more than a year; he was a young man equally agreeable and learned, who, by love of pleasure, had been doubtless brought into contact with Cardan over the dice, and by the instinct of a kindred genius, and by love of learning, had been drawn into a state of intimacy with the poor, maligned philosopher. Archinto, full of kindness, wisdom, tact, and well born also, already in repute for oratory[2], had the promise of a bright career before him; and he did afterwards attain, as we shall find, by his own merits, to high distinction. In 1534 his influence sufficed

[1] De Consol. p. 76. [2] De Vitâ Propriâ, p. 19.

to procure even for the despised Cardan a small appointment. He could not obtain for him authority to practise medicine, but he lost no time in endeavouring to make him independent of the college. Under the will of a deceased citizen named Thomas Plat, a small sum had been left to be applied yearly to the payment of a lecturer on geometry, arithmetic, and astronomy; the lectures to be delivered upon holidays. The office of lecturer under the endowment of Thomas Plat happened then to be vacant; and not many days after his return to Milan, the appointment was by Archinto's influence conferred upon the learned graduate in medicine, Jerome Cardan[1]. To the same kind friend he was indebted for the introduction to a few other sources of income, very trifling indeed; a deduction had been made from his small salary of seven crowns a year by the prefects of the Xenodochium[2], in whose gift the office was. His yearly receipts from all sources would not exceed fifty crowns, but he was a philosopher, and he and Lucia were quite able to subsist on that.

Not unwilling at the same time to earn, if possible, a better income, the new lecturer endeavoured to increase the fees paid for attendance on his courses, by rendering

[1] De Libris Propriis (1557), p. 23. De Libris Propriis. Lib. ult. Opera, Tom. i. p. 100.

[2] Ibid. De Ut. ex Adv. Cap. p. 546.

them as attractive as he could. With this view he occasionally substituted geography for the less popular details of geometry, and lectured upon architecture instead of arithmetic[1]. The mind of Cardan being thus set actively to work upon five subjects, was soon engaged on books allied to them in character; and five works were reckoned afterwards by the philosopher himself as the direct result of the appointment now in question.

Jerome then was in this way established with a slender income. Among the discouragements that pressed upon him from all sides in Milan, he had not lost faith in his future. He was thirty-three years old. He had been practising medicine for eight years, and had found himself at the end of that term, without patients and without character as a physician, utterly poor. He had been writing books from boyhood. Some of his manuscripts had been read by a few educated friends, and by one or two of them appreciated; others had perished through domestic mischances, others had been lent and carelessly mislaid, none had been printed. Yet Cardan was curious in pens, and because he regarded them as the keys that would enable him one day to open a door for himself into the temple of Fame, he wrote on with unflagging industry. He breakfasted on barley-bread and water, and

[1] "Ut vero magis audientes allicerem, pro Geometriâ Geographiam, pro Arithmeticâ Architecturam docebam. Hinc occasio nata conscribendi quinque volumina."

compared with the relish of an epicure the respective merits of nasturtium leaves, rue, parsley, and other herbs, as economic means of making bread and water savoury[1]. At the same time he worked on with a restless energy, and knew that he should win the prize on which his heart was set, not wealth for a few years, but renown for centuries.

In spite of all his eccentricities and errors, within a rude exterior the disputatious and excitable young scholar had shut up a fine spirit and a tender heart. His ethical writings uttered throughout life the language of a spiritual nature. The unique candour with which he publishes his faults—often such faults as many men commit and no man names—though he may have been stung to it by a contempt for the hollow affectation of respectability that would have hunted him for ever as a bastard, had he not been strong enough to stand at bay, and though such candour may sometimes be scarcely sane, yet it bespeaks a sturdy truthfulness, an innate generosity that we must honour. Jerome was a faithful son, and to the world at any rate an uncomplaining husband. There remain but slight and accidental traces of any discord between him and Lucia; of his wife's father, mother, brothers and sisters, he speaks with domestic kindliness; and though he accuses justly his own errors as a father, it will be found

[1] De Ut. ex Adv. Cap. Liber de Paupertate.

hereafter that his tenderness towards a miserable child forms one of the main features of his life. He claims for himself, and that also justly, the merit, that if he attracted to himself few friends, he never broke a friendship, and that if he found himself forsaken for a time by one of those few friends, he never used unkindly, whether as public accusation or as private taunt, knowledge obtained in confidential intercourse[1]. He had a rugged love of truth and justice; he remembered benefits, and when affronted could afford deliberately to abstain from seizing any offered opportunity of vengeance. He governed his pen better than his tongue, and carefully restrained himself from carrying into his books the heat he could not check in oral disputation. He left enemies unnamed, and though he now and then is found devoting some impatient sentences to writers who had treated his opinions rudely, yet it seems at first sight absolutely wonderful that a man so sensitive and so irascible, so beset by harsh antagonists as the weak-bodied Jerome, should have filled so many volumes with philosophy and so few pages with resentment. The wonder ceases when a closer scrutiny displays the difference in intellectual and moral weight between Cardan and most of his opponents.

[1] De Vitâ Propr. cap. xiv. pp. 67, 68. And for the next facts.

CHAPTER VIII.

LIFE AS A LECTURER IN MILAN—HOW JEROME AT LENGTH FOUND A MAN WILLING TO PRINT ONE OF HIS BOOKS—THE ISSUE OF THAT ENTERPRISE.

ARCHINTO, again, was perhaps the friend who obtained for Jerome the appointment of physician to the body of Augustin Friars; not a lucrative post, since the receipts from it are included among the other trifles which, together with the post of lecturer under the Plat endowment, made up an income of not more than fifty crowns[1]. Although denied authority to practise by the local college of physicians, Cardan was not the less Doctor of Medicine by right of his degree, and did not scruple to exercise his profession whenever he found any patient willing to consult him. The prior of the Augustines, Francisco Gaddi[2], a shrewd, severe man, whose influence over the members of his order made him an

[1] De Libris Propriis. Lib. ult. Opera, Tom. i. p. 100.
[2] De Libr. Prop. (ed. 1557) p. 123. De Vit. Propr. cap. xl. p. 193.

object of consideration among rival princes, had for two years lived in a bilious, melancholic state, afflicted with a skin-disease, and unrelieved by the advice of the most distinguished Milanese physicians. Jerome, when first admitted to attend upon the monks, found the prior cherishing despondent, though unfortunately distant, hopes of a release by death from all his fleshly troubles. By the good advice, however, of the young physician, or perhaps only by good fortune, Gaddi recovered. In six months he was well, and he was the first man of any note upon whom Jerome had been allowed to exercise his art.

Prior Francisco Gaddi belonged to a famous family in Florence, founded by three generations of painters—Gaddo Gaddi, who worked in the thirteenth century; Taddeo, his son; and his grandsons, Agnolo and Giovanni, in the fourteenth. The continuous labours of those men procured for their house wealth and fame, so that they left to their heirs a palace richly stocked with works of art, and a distinguished place among the noble families of Florence. A Francisco Gaddi was, in 1493, the Secretary of the Florentine Republic. The Prior Gaddi, settled at Milan, did not cease to be grateful to his health-bringing physician, though it was in his power to give him very little worldly help. Nor was it in Cardan's power to administer more potent aid to the scheming and ambitious monk in his last illness than a consolatory

letter[1]. Gaddi, who, as we have seen, fell among princes, ten years afterwards died in a dungeon, wretchedly.

Ludovico Madio was another friend to whom Cardan was introduced by the warm-hearted Archinto. Of Madio we know only that he was kind, and that the young struggler obtained from him ready help in times of need. Girolamo Guerrini, a jeweller, was at the same time an associate from whom Jerome obtained much curious information, and from whose experience he was able to enrich some of his books[2].

The works upon which Jerome was occupied in the months immediately following his return to Milan, were[3] a volume suggested by Sacrobustus upon Spheres, of which he wrote nine or ten books; a little work on Circles; three dissertations founded on the first and seventh books of Ptolemy's Geography; and one on the elements of Euclid, which grew in after-years till it contained three books, then was enlarged to seven, then to nine, then to fifteen, when it contained more than forty new propositions.

Very soon after his appointment as a lecturer Jerome had taken a house, and received his mother as a portion of his family. Since Clara had been hitherto depending

[1] The letter is included in his published works. Cardan relates the fate of his friend in the last of the three books De Libris Propriis. Opera, Tom. I. p. 107.

[2] De Vit. Prop. p. 69.

[3] De Sapientiâ, &c. p. 424.

on her own means of subsistence, it is probable that she was able to contribute a small fund towards the house-expenses. If she paid nothing, Jerome had indeed very great need to increase his income, or to make the most of fennel and nasturtium in his diet, for the household that depended on him for support consisted of himself, his wife, and infant son, his mother, a female friend, a nurse, a pupil (Ambrose Bizozoro, an ingenious, bold fellow, who became afterwards a sea captain), a maid-servant, and a she mule[1]. Upon the mule he rode abroad, and it is probable that in so doing he consulted less the received prejudice in favour of a doctor who can leave a horse or carriage waiting at the door, than the necessities of a body at all times infirm.

For the next five years Jerome was distressed, not only with bodily infirmities, but with poverty at home and unrelenting rivalry abroad. The very patients who had profited by his attentions often joined the cry against the poor physician-lecturer, whose eccentricities were more apparent to the vulgar than his genius. After Cardan had healed Bartholomæa Cribella, a noble matron, and her brother, the perverse brother was loud in ridicule against him[2]. But the physician-lecturer solaced himself at home with music and with dice, indulged as he could his taste for expensive writing materials and for rare books, read Aristotle and Plotinus for his pleasure, or his

[1] De Ut. ex Adv. Cap. p. 431.
[2] De Lib. Propr. Lib. ult.

favourite Italian poets, Petrarch and Pulci[1]. Above all, he continued to cover many sheets of paper with the written workings of his mind, and obtained consolation from his dreams of immortality.

Dreams really, not wild waking thoughts, became at that time guides and helpers to him. Being interpreted with admirable ingenuity into such meanings as accorded with his nature, they became prophetic. About four months after his return to Milan from the unsuccessful struggle in Gallarate, Cardan reckoned that he first received communications of the future in his sleep[1]. Then, as he believed, the dream-power commenced in its full force. Before that time, except in the case of the dream that heralded his marriage, his sleep had scarcely been disturbed with visions worth interpreting. As he got higher up the hill of life such mists increased about him.

His first dream, of the great series, was of the weary hill of life itself. It was the following[2]. At the close of the year 1534, when all was black about him in his worldly state, and all was looking blacker day by day, Jerome Cardan dreamed in the early dawn that he was running towards the foot of a mountain that stood to the

[1] De Vitâ Propr. cap. xviii. p. 80.

[2] De Libris Propriis (1557), pp. 21—26. De Libris Propriis. Lib. ult. Op. Tom. i. pp. 100, 101. For the two succeeding dreams and their interpretations.

right of him, and that he ran in company with an immense multitude, of every rank, and sex, and age; there were women, men, old men, boys, infants, poor men, rich men, clothed in many fashions. Then he asked, "Whither are we all hastening?" One of the company replied, "To death." In great terror the dreamer began then to ascend the mountain slope, drawing himself up by clinging to the vines through which he went, and with which that part of the mountain was all covered. They were dry vines with sere leaves, such as are seen in autumn when the grapes have all been gathered. He ascended with much labour, for the mountain at its base was steep, and as he looked back on his way, he saw that all the vines among which he had passed, no longer dry, were green and full of blossom. In a little while the ascent became easier, the mountain was less steep, and the dreamer hurried on. When he came near the top, he found the ground there barren, and across bare rocks and broken stones he was still pushing forward, as if by a strong impulse of the will. Suddenly he was on the point of plunging into the dark maw of an abyss, a chasm so huge and terrible, that, as a waking thought, it remained for the next thirty years a thing to shudder at. The dreamer, however, checked himself in his career, and turning to the right, wandered across a wintry plain, covered with heaths, timidly, as one uncertain of his way.

So he came before the porch of a sordid peasant's hut, thatched over with straw, and reeds, and rushes. There came out of the porch a boy, as of about twelve or fourteen years old, with pale features, and wearing an ashen-coloured cloak; he, taking him by the right hand, led him in, and as they passed into the hut the dream was broken.

Thousands of men have such dreams, and think no more of them. "I understood from this dream," says Cardan, "that I was destined to strive after immortality." He felt that he had a work to do in the world, that he was sent to do it by the Deity, whose hand so often had been visibly stretched out for his protection. All men, said the dream to him, run to death and to oblivion. The mountain was the Mount of Virtue, full of life, but without pleasures, as was signified by its being planted thickly with vines, but without fruit. The ascent of that mount is at first laborious, but afterwards becomes comparatively easy. The vines blossoming behind him—what could they signify? Certainly glory after death. The way over the wintry heaths might signify an easy close to life. What the boy might portend, however, Jerome could not then tell. Years afterwards, he believed that he had found him in a pupil, by whose face he was reminded of the dream.

Not long after this vision of the mountain, Jerome

dreamed that he was alone in the moon, naked, and disembodied. There, in his solitude, he heard only the voice of his father, and it said to him, "I am given to you by God as a guardian. All here is full of souls, but you do not see them, as you do not see me; nor do you hear them, for to the others it is not permitted to address you. You will remain in this heaven for seven thousand years, and as many years in single orbs, until the eighth. Afterwards you shall come into the kingdom of God."

So worked the restless brain of the young student when he and Lucia had gone to rest, she thinking of the next day and its cares, he of the next age and its glories. This dream of the moon had its own suitable interpretation. His father, Cardan said, was his tutelary spirit. His spiritual progress through eight planets, indicated, as he said afterwards, with remarkable accuracy, the different studies upon which he was to occupy his mind. The Moon meant grammar; Mercury, geometry and arithmetic; Venus, music, divination, poetry; the Sun, morals; Jupiter, nature; Mars, medicine; Saturn, agriculture, knowledge of herbs, &c. There were seven planets indicating studies to which he did really afterwards devote his mind, and the eighth planet held the scraps of knowledge that could be referred to none among the seven. Gleanings which the student picked up in such fields of science as he did not himself undertake to cultivate,

formed the last of the eight masses of study that were represented by his spiritual life in the eight stars.

In the succeeding year (1535) Jerome read through the works of Cicero, word for word as he tells us[1]. This task he had probably set himself, with a view to the improvement of his Latin style, his scholarship being at that time far from accurate. He had picked up Greek, French, and Spanish, without much care for learning them grammatically, and in Latin he wrote rather by tact and impulse than by rule. His labours were in some respects very much hindered by the badness of his memory[2], and they were also partly hindered, though on the whole more helped, by the restlessness of disposition which made him, in study as in action, prompt always in decision and impatient of delay. The same impatience made him sharp in argument; but while, as it has been already said, men surprised at his acerbity avoided wordy warfare with him, Jerome took no credit to himself for his unchallenged honours as a disputant. It was a property, as he affirmed, belonging to him which he could no more change than a stone could change its character. "Surely," he said, with a happy stroke of humour, "it is no matter of glory to the cuttle-fish that he can make the dolphins fly[3]."

[1] De Libris Proprils. Liber ult.
[2] De Ut. ex Adv. Cap. Lib. ii. p. 277.
[3] De Vit. Propr. cap. xiii.

Quick-witted, versatile, and candid, Cardan rarely suffered himself to be deceived into a respectful treatment of his own defects. Of his love of dice the best he could say in excuse was that "Philosophers may play, but Wise Men are as kings enjoying higher pleasures[1]." By skill in dice he even eked out his subsistence in the first days of his poverty at Milan, and perhaps earned more at the gaming-table than at the bedside; for on the hint of his rivals, it was soon a subject of discourse in Milan—the most frivolous of scandal-tattling cities[2], as he found reason to call it—that Cardan was too intent on mathematics to be very conversant with medicine. In his office of lecturer he had then been interpreting Vitruvius[3], and it was quite certain that his studies in connexion with his duties under Thomas Plat's endowment were of a kind to be regarded by the jealous public as incompatible with the thoughts which are supposed to revolve eternally in the minds of practising physicians. A physician even in our own day cannot acquire reputation in any branch of literature or science that does not bear directly upon tongues and pulses, without forfeiting a portion of the practice that he might have gained with ease if he had been a duller man, or if he had but hidden

[1] De Paupertate.

[2] "In urbe omnium nugacissimâ, et quæ calumniis maxime patet." De Libr. Propr. (1557) p. 32.

[3] De Sapientiâ, &c. p. 425.

some part of his light under a bushel. Cardan's hope of fame and profit as a doctor was being undermined by the reputation he acquired as an ill-paid teacher of geometry, arithmetic, geography, and architecture. It is easier, he writes, to prop a falling house than to rebuild it after it has fallen. He resolved, therefore, to support his sinking reputation in the art of medicine by writing a work strictly professional. Following up the notion with his usual impetuosity, in fifteen days he wrote two books on the bad practice of medicine by the physicians of his day —*De Malo Recentiorum Medicorum Medendi Usu*[1]—not a propitiating subject, certainly. A small tract was written about the same time on the noxious ingredients in simple medicaments. These Cardan put aside, or lent to friends in manuscript, for he was unable to pay a printer, and knew no one who would bear the risk of publishing what he had written.

When, in the same year 1535, the academic session closed, Jerome's young patron was about to leave Milan. In that year had died Francisco Sforza, Duke of Milan, and Philip Archinto had obtained so much esteem and trust in his own town, that he was selected by the magistrates as the most fit person to accompany Massimiliano Stampa, their ambassador to the court of Charles V. upon

[1] De Sapientiâ, &c. p. 425. De Lib. Prop. (ed. 1557), where he says that he wrote the book, "ut etiam in Medicinâ aliquid scire viderer."

the occasion. Francisco, the last Sforza, he whom Cardan had encountered among gamblers, died at the age of thirty-nine. Expelled from home by the French, his childhood had been spent in Germany. In 1521, the Emperor and Pope together had resolved upon his re-establishment. The French resisted their design until the overthrow at Pavia, but after that decisive battle, Charles had delayed the execution of his promise. Then Francisco had joined the Italian league, had been betrayed by Marquis Pescara, besieged in Milan by the emperor, and reduced in 1526 to the abandonment of his designs. In 1529 the Emperor and Pope had agreed to receive him again into favour, and had allowed him to buy of them his dukedom with a large sum of money. From that time he had given little trouble to his master, but in 1534 he had beheaded a subject named Meraviglia, who was supposed to serve the French interest at his court, and troubles might have followed had the duke not died in the succeeding year. He was a credulous, weak man. Leaving no children by his wife Christina, he bequeathed his dukedom to the emperor. This last fact was the chief subject of the embassy to which Archinto was attached. The young noble who had shown in Milan so much promise of a prosperous career, a man of the world in the true sense of the term, genial, prompt, and learned, found his opportunity when he was sent into the presence of the

emperor. Charles liked him, and sent Stampa back alone, retaining Cardan's patron in the character of secretary[1].

It will be convenient here, in a few words, to tell the fortune of Archinto. In the next year, 1536, he was created a Count Palatine; afterwards, when he was sent to Rome on imperial business with Paul III, the Pope, who thought him a man worth acquiring for the Church, persuaded him to consult his interests by taking holy orders. He did so, and was promptly appointed Apostolic Protonotary and Governor of Rome. In 1539 he was ordained Bishop of Borgo San Sepolcro; in 1546 he was transferred to Saluzzo; and after having served as vicar to four Popes, came back to his own town as Archbishop of Milan, in 1556. Two years afterwards he died, and being dead, his life was written by Joannes Petrus Glussianus in two books.

Archinto then, in the year 1535, being about to leave Milan with Massimiliano Stampa, soon after the close of the academic session, Jerome employed his vacation very busily in writing certain treatises, which Archinto promised to take for him, and commend, as well as he was able, to the favourable notice of the Pope[2]. Cardan had heard of the

[1] Josephi Ripamontii Canon. Scalens. Chronistæ Urbis Mediolani, Historiæ Patriæ, Libri x. Med. 1641, p. 698. In the succeeding pages is a full account of the manner in which Archinto passed into the service of the Church, and of his subsequent career. His success, says Ripamontius, was so great, that "ad consilia negotiaque omnia adhibebatur, et gravissimi cujusque consilii author ipse erat." Ibid. p. 704.

[2] De Sapientiâ, &c. p. 425. The same authority will cover the remainder of the paragraph.

Pope's liking for astronomy, and therefore took pains to suit the humour of his Holiness with two books, of which one was a Supplement to the Almanacs, the other was a sensible technical work, with a title that might be considered startling—"Emendation of the Celestial Movements, by Jerome Cardan." They were both written in fifteen days, and duly taken by Archinto; but they produced no supplement to the poor scholar's income, or emendation of his daily fare. He spent the other two months of his holidays in the preparation of an elaborate work on Arithmetic, which occupied his mind so thoroughly that problems and solutions filled his very dreams. Thus even in his dreams he found hints for his book; and the subject being thus suggested to him, an inquiry into the subject of dreams, and a treatise upon them, closed the year.

Cardan was thirty-five years old, and up to this date, though an indefatigable author from his youth up, not a sentence of his writings had been printed. At last, however, the great day was near when for the first time he should talk to the whole world in print, and ascertain whether he could really make it worth men's while to pay attention to his talking.

Mention was made in a former chapter of a college friend, Ottaviano Scoto[1], to whom Jerome had lent some

[1] De Libris Propriis (ed. 1557), p. 29. De Lib. Propr. Lib. ult. Opera, Tom. i. p. 102, for the succeeding narrative.

early essays, and who had lost them. He was a pallid youth, one of the few old companions whose friendship Cardan afterwards desired, avoiding richer and more powerful associates. Octavian paid absolute homage in his friendship to the stronger mind of Jerome, adhered to him through good and ill report, believed implicitly in his great talents, and loved him with the utmost warmth of youthful friendship. By the death of his father in Venice, this believing friend, Ottaviano Scoto, became master of a printing-office.

Then Cardan dusted his manuscript about the Bad Method of Practice among Physicians, and opened his heart to Scoto. If he could only prove to the Milanese that he was not the worse physician for his knowledge of geometry, a better day might shine into his chambers. If he could only print his book! The distant hope of a great good, to attain which the poor philosopher had sighed so long in vain, seemed but a trifle in accomplishment. "What you propose is a light matter," said the sanguine printer, who took cheerfully all risk of publication on himself. "And if," he added, "I knew that I was to lose all my outlay on it, I would still print the volume for your sake. I think, however, that it will be no great venture." The book—De Malo Medendi Usu—was therefore printed at Venice, in 1536, Scoto alone correcting the proofs, because there were no ready or

cheap means of communication between Venice and Milan.

It was a clever book, denouncing seventy-two errors in practice. Such errors were the total denial of wine to the sick[1], the denial of fish, and the allowance of flesh to people sick of fever[2], the belief prevalent in many quarters that there could be found one mode of cure for all diseases[3], and the doctrine that no patient should be bled while suffering under acute pain[4]—a woful sentence to some—sentence of death, for example, to the man tormented by the agonies of an acute inflammation of the peritoneum. He taught that to do nothing with physic was much better than to do too much, and urged the great number of things that have to be considered before a man desiring to act rightly should set his hand to a prescription[5]. The book was clever, and was of a kind to meet with rapid sale.

It did sell rapidly, but its appearance plunged the luckless author into new distress. It had not been long subject to criticism before Cardan was made aware of so many petty faults in matter, style, and grammar, that any pride he may have himself had in his work when he sent

[1] De Malo Medendi Usu (Venet. 1536), cap. vi. p. 13.
[2] Ibid. cap. x. p. 18. [3] Ibid. cap. xiv. p. 22.
[4] Ibid. cap. xl. p. 48.
[5] So he defines the spirit of the book in his second work, De Libris Propriis, p. 29.

it to the press was altogether humbled[1]. Many years afterwards, when he re-issued the work with the number of its sections increased to a hundred, having spent twenty-eight days in correcting what he had written in fifteen, he refers in this way to its first appearance: "I blush to acknowledge that there were more than even three hundred blunders of mine in this book, exclusive of misprints. And I long since had it in my mind to blot it out from the number of my offspring: but to that course there was the objection of a certain special usefulness connected with it, by which it had been made so saleable that in its second year the printer would have issued it again to the public if I had not resisted his desire."

But the sound part of the book which, in many points, condemned and opposed prevailing practices, of course received from the doctors of Milan, hostile enough already, the strongest condemnation and opposition. The cry was raised against its author that he did not practice his profession, and it was asked, how then could he presume to teach it to the men who did[2]. The unlucky title of his book was quoted constantly against him, and if anybody thought of seeking medical assistance from Jerome

[1] See the dedication to the revised issue of the book, Opera, Tom. vii.

[2] "In artis autem operibus negligerer, cur erat ut alios docere vellem." De Libris Propr. (ed. 1557) p. 29. "Et modum alium medendi observans ex titulo libri nuper edito, jam propè ab omnibus habebar," p. 32.

Cardan, it could be urged against him not only that he was not recognised by the local College of Physicians, but that he was an eccentric man who would imperil the lives of his patients by rash crotchets of his own. He was a poor man, maddened by poverty, struggling against men high in repute and rich. He was a young man complaining of his elders[1]. Rivals and enemies looked grave and shrugged their shoulders, merely pointing out that the author of a book "On the Bad Practice of Medicine in Common Use" might have a better practice of his own; but from the very title of his work it was obvious—as the public generally could but admit—that he opposed singly the experience and learning of the whole profession. He, too, a young man, who, as they all knew, was a lecturer upon geography, geometry, arithmetic, and architecture.

[1] De Libris Propr. (ed. 1557) p. 30. I must quote part of his own account of the misfortunes that attended this first literary venture:—"Sed et longè aliter commodum, quod expectabamus ex illis libellis, nam non parvam retardationem attulit ad gloriam in arte consequendam. Nacti nanque æmuli ex argumento libri occasionem, dicebant, Nunquid modo dubitatis hunc insanire? aliumque medendi modum aliamque, quàm nos, medicinam profiteri, cum in tot rebus ritum nostrum accuset? Itaque meritò, ut dicebat Galenus, qui tot insanientibus contradicere niterer, insanire visus sum: cum enim necessarium esset me vel illos aberrare quis mihi crederet contra tot probatos usu viros, divites, sensu magnâ ex parte, nec mediocriter eruditos, cultos vestibus, ornatos moribus, facundiâ vulgari præditos, amicis atque affinitatibus potentes, surâque populari in sublime elatos, inde, quod maximum erat, tot artibus ad cavendum ad fallendumque instructos. Ego vero pannosus, ita ut mihi non conveniret illud, Vestibus inquam homini surgit bona fama decusque. Itaque egregio hoc meo invento pene fame periî."

And this was all that had resulted from the book written and printed with so much hope of a happy issue. It was to have led the way to sick-beds, by the proof it would afford that he who wrote it had thought soundly and deeply as a practical physician. It was to have brought to him the first honours of public authorship. "But where I looked for honour," said Cardan, "I reaped nothing but shame[1]." The book damaged him in every respect, but one. It had satisfied the printer, who derived a profit from its sale. It had been bought to be abused; the printer rejoiced, while the author grieved. Ottaviano Scoto, satisfied with his experience, held his type still at the service of the poor philosopher, and so at any rate one difficulty had been overcome.

[1] De Libris Propriis. Lib. ult. Opera, Tom. i. p. 102.

CHAPTER IX.

PHYSIC AND PHILOSOPHY.

A MAGPIE in the court-yard chattered more than usual on the last day of November, 1536. Cardan knew, therefore, that something was about to happen. He expected news or an arrival, and was not deceived, for on the evening of that day Lodovico Ferrari was brought to his house as a famulus[1]. Lodovico, then a boy of fifteen, was brought by his uncle Vincent from Bologna. The servant, full of talent, soon became a pupil and a friend. He, of all Cardan's pupils, was the one who lived to be afterwards the most distinguished, inasmuch as the natural bent of his mind easily caused him to share Cardan's own very decided taste for mathematics, and he had power enough as he grew older to think onward for himself, and earn for his name—though he died young—a permanent place in the records of that science.

Not very long afterwards, it happened that there came to Milan a tall, lean man, with a sallow skin and hollow eyes, awkward in manner, slow in movement, sparing of

[1] De Vitâ Propriâ, p. 214. Vita L. Ferrarii Bononiensis, a H. Cardano Descripta. Op. Tom. ix. p. 568.

his words, a great mathematician. He was a native of Brescia, and his name was Zuanne da Coi[1]. He brought word to Milan that there had been discovered two new algebraic rules, for the solution of problems of a certain kind that concerned cubes and numbers. "I asked," said Cardan, "by whom?" "By Scipio Ferreus of Bologna," he replied. "Who is possessed of them?" He said, "Nicolo Tartaglia and Antonio Maria Fior; but Tartaglia, when he came to Milan, taught them to me, though unwillingly enough." Then Jerome continues, "When I had thoroughly looked into those matters with Lodovico Ferrari, we not only made out the two new demonstrations, but discovered in addition a great number of others, so that I founded upon them a book on the Great Art." Of his skill in algebra Cardan was justly proud; it was the department of knowledge in which he displayed perhaps the most remarkable evidences of his intellectual power. One of his processes, upon which we shall hereafter dwell, is still known by his name in mathematics. The researches prompted by Zuanne da Coi had some influence, perhaps, upon the character of Jerome's second venture into print, which was a step towards that book of the great art about which much will hereafter be said.

[1] De Libris Propriis (ed. 1557), p. 36. De Libr. Prop. Lib. ult. Opera, Tom. i. p. 103.

His second publication did not, however, follow very rapidly upon his first abortive effort for success. There were other enterprises to engage his mind, and authorship did not appear to be a happy way of courting fortune. Towards the end of the year 1536—at about the same time when Ferrari came to him—he was invited to teach medicine publicly at Pavia, but declined the offer, because he did not clearly see from what source he was to derive a stipend[1]. Soon afterwards, still in the same year, letters from his friend Archinto (to whom, of course, he had dedicated his first book) summoned him to Placentia, where it was hoped that he might find opportunity of pushing his fortunes by acquiring for himself the active good-will of Pope Paul III.[2] Archinto, however, had prepared the way for him in vain. An ungainly and plain-spoken philosopher was not the man to make way at a papal court.

It is worthy of remark, that those who would have recoiled most certainly from a mere clumsy cynic, men who had not unlearnt the generosities of youth, who had come newly with fresh hearts and stirring minds into the market of the world, men like Archinto, were almost the only people who held out to the unrecognised philosopher their helping hands. Such a friend Jerome found at

[1] De Vitâ Propriâ, p. 19. [2] De Sapientiâ, &c. p. 425.

Placentia in the young and handsome Brissac (Marshal Cossé), there serving as lieutenant to the King of France, and already famous for his gallantries[1]. Brissac was four years younger than Cardan—a man delicate and beautiful, but agile and robust; at the siege of Naples he had singly taken prisoner a knight in armour, though he was himself on foot without the defence of casque or cuirass, having no weapon but a sword. Brissac had taste and scholarship, with a quick sympathy to feel the merits of Cardan; he therefore besieged Louis Birague, commander of the French infantry in Italy, with petitions on behalf of the poor scholar. The hopes of Jerome were excited very much, but there was nothing done.

He went home therefore to his family at Milan, resumed his harness as an unsuccessful and, so far as the Milanese College was concerned, illegal practitioner, wrote more books, prepared more lectures, and continued the instruction of his apt young pupil Lodovico.

Among the few patients whom Cardan attended, there was a certain Count Camillo Borromeo, whom he had cured of a serious disorder; but because Jerome declined to sit up a whole night with him when he was troubled with some other ailment, the mean-spirited count had carried his complaints about the town: "Therefore," says

[1] De Vitâ Propriâ, p. 20. "Erat enim Brissaccus Prorex singularis in studiosos amoris et humanitatis."

the offended physician, "I had left the man." But chancing afterwards to pass, he was called in to look at a sick nurse, whom in two days he cured; soon afterwards the count's only child, a boy of seven, being ill, Jerome was urgently invited to attend. Now it so happened that on the preceding night that dreamy sage had been troubled with a complex vision of a snake, which, as he thought, portended danger to himself. When therefore he went to Borromeo's house and found the child's pulse pausing after every four beats, he said to himself, though the disease seems light this boy will die. Having then written a prescription, which contained one powerful ingredient, and placed it in the hands of a messenger who was about to take it to a shop to be made up, his dream suddenly recurred to him. Its application was made very obvious by the fact that Borromeo having added a snake to his arms, possessed a country-house painted over with vipers. The boy will die, he thought, and as the present ailment seems to be so light, if it be found that any active drug has been administered, it will be said after his death that I have killed him. He therefore called back the messenger, and substituted for his first prescription another, containing only the most harmless ingredients[1].

[1] "Medicamentum quod vocatur Diarob, cum Turbit, propinare in morsulis decreveram: et jam conscripseram, et nuncius ad pharmacopolam ire cæperat, recordor somnii, 'Quiscio,' mecum dixi, 'ne hic puer moriturus ex signo præscripto. . . . .' revoco nuncium, qui non-

But he predicted to the mother the boy's death. Other physicians who were summoned spoke more hopefully, and after the death had really taken place, gratified their jealous dislike by secretly asserting that the mathematician had not understood the boy's complaint. They were unable, however, to say that his medicine had been of a kind to cause or hasten any fatal issue. So he avoided, through attention to the warning dream, great danger to himself, because if Count Borromeo had believed that the loss of his one child was caused by a prescription, he would certainly have killed the doctor who had written it. Many indeed at that time heard so much ill spoken of Cardan, that it appeared to them as though it would be but a just thing to kill him, if the law were not so undiscriminating as to protect even lives like his. Borromeo never ceased to alleviate his grief for his lost child by curses loud, frequent, and public, upon his physician. As for the general public of Milan, it had come to the conclusion that the Plat lecturer was mad, through poverty.

The luckless author, greatly vexed at the large number of misprints which had disfigured his first publication,

dum quatuor passibus ab ostio aberat, dico deesse quippiam quod addere vellem, lacero priusfactum, clam, et aliud scribo è margaritis, esse monocerotis, gemmis. Datur pulvis evomit," &c. De Vitâ Propriâ, p. 148. For some of the details in the text, see also De Libris Propriis (1537), p. 31, and Synesiorum Somniorum, Lib. iv. cap. 4. Opera, Tom. v. p. 724.

issued a new example of his skill as a philosopher, printed at Milan under his own eye, either in the same year 1536, or in the year succeeding[1]. It was printed also at his own expense, and as he was in no condition to sustain a heavy charge, it was but a work consisting of five leaves, upon judicial astrology. His neighbours cried him down at once for an astrologer; his little venture was again unlucky.

A touch of superstition belongs also to this as to every period of Jerome's life. It happened in the year 1536, about the month of July[2], when he lived by the Porta

[1] De Libris Propriis (ed. 1557), p. 40.

[2] De Vitâ Propriâ, pp. 223, 224. Cardan tells the story at more length. As I desire the few quotations in these notes not simply to justify the text, but also to provide for some readers means of obtaining glimpses of Cardan himself, I quote this little narrative in his own words. The tone of natural credulity about it is particularly striking. There is a great deal of agreeable *naïveté* in Jerome's nonsense; it had more in it of the sick wit of a child than of the gloom of full-grown superstition. "Ergo anno MDXXXVI. cum habitarem in P. Tonsâ, erat mensis ni fallor Julii, prodiens è cœnaculo in Cortem, sensi maximum odorem cereorem quasi nuper extinctorum; territus voco puerum interrogans an quicquam sentiret, ille cum de strepitu intelligeret, negabat, Monui non de sono intelligere, sed an odorem perciperet, dixit 'O quam magnum sentio cereæ odorem,' dixi 'Sile' et ancillam rogans, et uxorem, omnes mirabantur præter meam matrem quæ nil sentiebat, credo gravedine præpedita: Itaque mortem imminere hoc ostento autumans, cum ad lectum contulissem me, non poteram obdormiscere, et ecce aliud prodigium priore majus, in vitâ publicâ grunnientes sues, cum nulli ibi essent, inde anates similiter obstrepentes: Quid hoc mihi, et unde tot monstra? Et anates cur ad suas veniunt? qui totâ nocte grunnientes perseverarunt. Mane tot visis perculsus, nesciebam quid agerem: vagabar extra urbem a prandio: et rediens domum, video matrem quæ me hortabatur ut properarem, ictum fulmine vicinum Io. Præfectum alias pestilentiæ: Hunc ferebant cum xii. ante annis ei

Tonsa, that as he went out of his door one evening, after supper, he perceived a smell as of extinguished tapers. He called out his household, and the smell was recognised by all except his mother, whose nose was disabled by a cold, and it was thought by all that such a smell must certainly be ominous of something. That night the physician was continually disturbed by a strange sound as of sows and geese outside. When morning came, Cardan went out to wander in the fields, very solicitous about these omens. On his return he was hurried off to see a neighbour—a man of no very good character, reputed to have been a thief in the office he had once held as prefect of the plague—who had been struck by lightning. He proved to be dead, and so the meaning of the presages became quite clear to the philosopher. "After my neighbour's death," he says, "my mind was easy."

Work of the pen in the mean time went on. Seized by a bold idea, Jerome brought his astrology to bear on the Nativity of Our Lord, and began a Life of Christ confirmatory of his horoscope[1]. He wrote also three medical

muneri vacaret, quod pestilentia sæviret, multa rapuisse: concubinam habebat, nec exomologesim subibat: forsan et alia pejora admiserat: erat autem vicinus, ut non intercederet nisi domuncula, vidi et cognovi esse mortuum prorsus, tunc liberatus sum a curâ, illius obitu."

[1] "Succedente anno" (*i. e.* 1539) "tres libros de Christi vitâ superaxi, qui jam antea per triennium erant inchoati." De Sapientiâ, &c. ad fin. The first book treated of his Birth, the second of his Life, the third of his Laws.

tracts, and began a work on the Arcana of Eternity, designing thereby to please the Marquis Avalos, a governor of Milan, who had shown some friendliness towards the poor wise man whom so few heeded.

Alphonso d'Avalos[1], Marchese del Guasto, was another of the young and clever men who could recognise and enjoy the vigour of a genius that repelled the prim and vulgar by its eccentricities. He was a year younger than Cardan, the son of Inigo d'Avalos, and going early out to war was, at the age of twenty-one, present at the battle of Bicoque. From the subsequent contests in the Milanese, to which reference has been made often in preceding pages, he had been rarely or never absent. After the death of Antonio Seva he had been appointed general

[1] I have seen it somewhere stated that there is a MS. life of this D'Avalos in one of the Italian libraries, I think at Florence. In a note appended to his name in Roscoe's memoirs of Cellini, it is said that he was "the son of the great Ferdinando d'Avalos, Marquis of Pescara." In the Biographie Universelle he is called his nephew. Ferdinand was his cousin. The first of the family—it belonged to Navarre—who came to Italy, was Inigo, first of the name. He following Alphonso V. of Arragon to Naples, married a sister of the Marquis Pescara, who happened to be heir to his estates. In this way he acquired great wealth and a new title. Of the three sons of that couple, one died single, and two, Alphonso and Inigo II., married. "The great Ferdinand" was the son of Alphonso, and inherited through him the title of Pescara. The Avalos connected with the life of Cardan was the son of Inigo II., and inherited from him the Marquisate del Guasto. See Imhof Geneal. Ital. et Hisp. and the article on the Avalos family in Zedler's *Universal Lexicon aller Wissenschaften und Künste*, vol. ii. col. 2093—8. This old German Lexicon is a repertory of minute facts and references to authorities concerning half-forgotten things and people, through which I have had easy access to much valuable information.

and governor in Milan. In the year 1535 he joined the expedition of the Emperor to Tunis, and obtained military promotion. D'Avalos was by no means a man of the best stamp. He was clever, but unscrupulous; in words and ways fond of display. He sought the smiles of ladies as a dandy, and in that character was probably unequalled in his time and country. His dress was elaborate, and he perfumed not only his own person, but even the saddle upon which he rode. In the year 1536 his patronage of Jerome was but nominal. Four years afterwards, however, the marquis was sent by the emperor as chief ambassador to Venice; and before that time, on the recommendation of an influential friend, Jerome had come to be numbered and paid among the members of his suite. He had worked, however, for the great man's favour—had gone courting to him; and in one of his works he relates incidentally his regret that he was troubled with a severe cold at a time when he was—in furtherance of his suit—assiduously paying to the great man evening visits. He put his feet, however, in hot water, took Cassia Nigra, and in three days got rid of the ungraceful huskiness[1].

The name of this patron will recur several times as the narrative proceeds, and I know no better way of giving a

[1] "Opprimebar aliquando Coll. nostri auctoritate. . . . coactus sum principis Alphonsi amicitiam colere, id faciebam horâ vespertinâ," &c. De Aquâ. Opera, Tom. ii. p. 585.

preliminary insight into his character than by carrying on to the end this brief sketch of his life. D'Avalos, while at Venice, treacherously murdered two French ambassadors, in order to obtain possession of their papers. In 1544 he lost the battle of Cerisoles, in Piedmont, being the first man to take flight, although he had set out with the boast that he would bring home the young Duke of Anjou as a plaything for the dames of Milan. He had also taken with him on his march four thousand chains, with which he was to bind Frenchmen to the galleys. The unexpected reverse preyed upon his mind; never recovering from his chagrin he was taken ill, and died in the year 1546, ten years after the date from which this narrative has wandered.

While these facts are told against him, it should also be said that Alphonso d'Avalos used his great wealth in such a way as to merit the commendation of all churchmen and men of letters, for he was a lavish patron, as Cardan well knew, when he cultivated his good-will. At first he had been military governor of the Milanese district, Cardinal Caraccioli being the civil governor of the town. After the cardinal's death no successor was appointed, and D'Avalos was supreme. "His mild rule," wrote a Milanese churchman while his memory was green, "revived the province; and he was so liberal in sacred things that he in some degree made good the loss occasioned by

the absence of an archbishop[1]." "He was a man," says the same authority, "of the most polished manners, studious of the fine arts, high minded, prodigal of his own wealth, and little greedy of the wealth of others[2]." All that was said evil of him was ascribed to the malignity of his enemies, who added to the grief of his last days by causing the Emperor to demand an oversight of his accounts. After his death at Vigevano he was brought to Milan, and buried publicly in the cathedral, with orations, and all honours that the clergy could bestow upon him.

It was at the end of the year 1536 then, during the vacation, that, to please this marquis, Jerome began a book on the Arcana of Eternity. In the year 1537—he being then thirty-six years old—the world still used him ill, and prompted him to write two works[3], one upon Wisdom, one on Consolation—philosophic shields against the outer miseries of life. In the same year he proved himself a true philosopher by burning about nine books that he had written upon various subjects, because they seemed to him on re-perusal empty and unprofitable. His manuscripts had accumulated into a great farrago, chiefly of medical papers, and he destroyed so much that

[1] Ripamontius Chronista Urb. Med. (ed. cit.) p. 725.
[2] Ibid. p. 710.
[3] De Libris Propriis (1557), p. 39.

there remained whole little beside his printed work, and the materials belonging to the treatise on arithmetic, which he proposed to publish soon, if possible.

The work written for D'Avalos on the Arcana of Eternity was kept afterwards unpublished by the Church, but Cardan himself liked it, and quotes the headings of the chapters[1]. The work would have been a curiosity had it come down to us; only a fragment, however, is preserved. It was divided into seven books. The first treated of God and the origin of what we should call the Cosmos—the number of worlds and their magnitude. The second book discussed the constitution of the divine world which was called intelligible, or immaterial; the third was on the constitution of the sensible or material world; the fourth book was on the order of human things; the fifth on the succession of things natural; the sixth on the succession of things human; and the seventh on the end of the world to which those successions lead. The subjects of the chapters in each book are communicated to us, but it will suffice here to quote, by way of illustration, half a dozen of the heads under which Jerome treated of things human. They were of this kind: On the Likeness between the World and Man and on the Equal Distribution of Parts; on Sense and Memory; on Contemplation; on Numbers; on Virtue

[1] De Libris Propriis (1557), pp. 42—51.

and Sin; on Happiness; on the question, Are Assemblies worthier than Individuals? on the Existence of some Truth in all Falsehood, and of some Falsehood in all Truth; on the Necessity, Uses, and Harms of Law. There must have been no little boldness and originality of treatment in a book of this kind written by Cardan; but as it was not to be published, I must say no more of it, and turn to works with which the world at large became acquainted.

When he sought fame in print as a physician, he had been told that he was only qualified to write on Mathematics. Well, he would publish next a work on Mathematics; upon that subject also he had new ideas to communicate. Should he be honoured as a prophet then by his compatriots? The Milanese physicians still rejected him. In 1537, Jerome humbled himself again to petition for admission to their college. He had, indeed, for a short time consented to what he considered a dishonourable adjustment of his quarrel with them. The truce did not last long, and he was again formally rejected[1]. In the same year, however, a new patient was obtained, whose friendship gave him hope of better days. Anxiously must they have been desired by Lucia, who had by this time two children to support; the second child a daughter, Clara, having been born in the preceding year[2].

[1] De Vit. Propr. p. 147.

[2] De Vitâ Propr. p. 20. The date is inferred readily from the state-

In the preceding year his household was increased, his daughter Clara had been born; and in that year, 1537, of which we now speak, his household was diminished, for it was then that his mother Clara died[1]. While she lay awaiting death, Jerome of course had all his senses open for the perception of some sign or omen. Once in the night he heard a mysterious tapping, as of the fall of water-drops upon a pavement, and he counted nearly one hundred and twenty distinct raps. He was in doubt, however, as to their significance, or whether they were indeed spiritual manifestations, for they appeared to proceed from a point to the right of him, in contradiction to all doctrine concerning portents of calamity. He believed, therefore, that "perhaps one of his servants might be practising on his anxiety." But for the purpose of assuring his faith in the genuineness of the supernatural communication that he had received, the raps were repeated—he supposed that they could have been repeated only for that purpose—on the next day when the sun was high, and he, being up and awake, could assure himself that nobody was near him. There were then fifteen strokes; he counted them. Afterwards he heard in the night a heavy sound as of the unloading of a waggonful

ment there incidentally made that his daughter was two years younger than his eldest son.

[1] "MDXXXVII, cum mater obiit, ..." Paralipomenon. Lib. II. cap. XXI. Opera, Tom. X. p. 471.

of planks. It caused the bed to tremble. After these events his mother died; but Jerome adds: "Of the signification of the noises I am ignorant[1]."

Turning from death to sickness, we revert to the new patient from whose friendship better days were to be hoped. There was a druggist named Donato Lanza[2], who had been cured by Cardan of a spitting of blood with which he had been for many years afflicted, and who therefore looked up to his benefactor as the most eminent of all physicians. He having the ear of a distinguished senator, deep in the counsels of the emperor, Francisco Sfondrato, of Cremona, often endeavoured to persuade him that he would do well to obtain Jerome Cardan's opinion upon the condition of his eldest son The boy suffered for many months from puerile convulsions, and was to be counted rather among the dead

[1] De Vitâ Propr. p. 224. The spirit-rappers of the present day are welcome to the exact text "Cum mater esset in extremis, experrectus, et illucescente altius sole, videns et nihil videns xv. ictus (illos enim numeravi) audivi, quasi aquæ guttatim in pavimento cadentis, nocte autem præcedente, circiter cxx prope numeravi, sed dubitaveram, quod hos a dextrâ sentirem, ne quis domesticorum mihi anxio illuderet, ut hi ictus non viderentur in die contigisse, nisi ut nocturnis fidem facerent Paulo post ictum quasi curris tabulis onusti simul se exonerantis, supra laquearia sensi, tremente cubiculo. Mortua est ut dixi mater, ictuum significatum ignoro"

[2] De Libris Propriis (1557), pp 123—130, for the next story, and for the two cases afterwards narrated. The account of the introduction to Sfondrato is amplified from another narrative of the same facts in the De Vitâ Prop. pp. 188—192.

than among the living, being distorted, and imbecile both of mind and body; yet in time he did recover. Then a younger son of the same senator was attacked in the ninth or tenth month of his life by fever. Sfondrato's old friend and family physician, Luca della Croce, was called in, a very respectable man, procurator of the College of Physicians, which inscribed also Sfondrato among its patrons. Luca's brother Annibale had even thrown some lustre of scholarship about the family name, by writing Latin poems and translating Statius badly. The same Annibale we shall presently find furnishing half a dozen recommendatory verses to Cardan's next publication. Luca della Croce saw the child, and promised fairly for it, as became a well-spoken physician; but sharp convulsions suddenly set in, and made it fit that there should be further advice taken and formal consultation held upon the case. Luca proposed to summon Ambrose Cavenega, one of the leading members of the faculty in Milan, holding rank as imperial first physician, a man whose eminence Jerome had acknowledged by dedicating to him, with high compliment (little esteemed), the small tract upon simple Medicaments added to his book on the Bad Practice of Doctors. Sfondrato being entitled by usage to name the third voice in the consultation, remembering all that had been said to him by Donato Lanza, proposed that they should meet Jerome Cardan.

At the second hour of the day—it was summer time—the three physicians were assembled at the bedside, the father of the patient being present. Della Croce was the first to express his opinion, then Cardan followed, Cavenega being the last speaker, as the senior man. Cardan said: "This is a case of opisthotonos." The first physician stared, for he had never heard the word before. It is a word still commonly used in medicine to express the excessive action of one class of muscles by which limbs or body are curved backwards. Della Croce said: "How can you ascertain that?" Cardan showed how the child's head was forcibly held back, and could not be pulled forwards into natural position. Della Croce lauded courteously his discernment. Said the father then to Jerome, "You appear to know what the disease is, do you know also how it can be remedied?" Cardan turned to his colleagues, and proceeded glibly to quote aphorisms of Hippocrates concerning fever and convulsions. The colleagues, conscious that there could result only loss of dignity from any words of quarrel, flattered the unrecognised physician with some praise, and left to him the treatment of the case. He ordered a light milk diet, by denying the nurse meat, prescribed fomentations and external application of linseed oil and lilies, ordered the infant to be kept in a warm room and gently rocked to sleep.

Afterwards, when Jerome was alone beside his patient, Sfondrato said to him: "I give you this child for a son." Jerome was astonished. "Consider him your own," said the senator; "do with him as you would with your own child. Do not concern yourself about the other doctors. Let them be offended if they will." Cardan replied, that it was his desire to act as their ally, and to receive assistance from them in the case, of which the issue could be only doubtful. His course of treatment was, however, followed, and the child recovered in four days. The father reflected that under the care of Della Croce his eldest child had lain six months uncured, and so came to the abrupt conclusion that Donato Lanza had with reason praised Jerome Cardan to him as the most skilful of the Milanese physicians. The senator Sfondrato—who became afterwards a cardinal—abided by Cardan from that time forward as a good patient and a faithful patron.

Having made up his mind emphatically on the subject of Cardan, and distinctly weighed against him Della Croce and Cavenega, Sfondrato began to reflect upon his friend's position in relation to the College of Physicians. Della Croce was the procurator; Cavenega had openly declared that he could not praise merit in a man who was disowned by the faculty; the senator formed, therefore, at once a strong opinion that the exclusion of Cardan from their body by the Milanese physicians was the consequence

not of his illegitimate birth, but of his dreaded superiority of genius. Sfondrato, feeling warmly the wrong done to the poor lecturer, narrated his own experience of Jerome's skill to the whole senate, engaged on his behalf the interest of the Marquis d'Avalos, and of other ministers and men robed in the purple of authority. Would the physicians remain obdurate ?

I add here one or two other examples of Cardan's medical practice which belong to this part of his career. Branda Scoto, brother to Ottaviano, from whose press the Bad Practice of Doctors had issued, being, like his brother, a familiar friend, took Jerome to see Martha Mott, a woman of thirty, who lived in the Via Sozza. She had been for thirteen years confined to a chair by an ulcer in the left leg, which limb was too weak to support her. She had also flying pains, and a general wasting of the body. After two years, under Cardan's treatment, she retained nothing to remind her of her disease but a limp in walking. Twenty years afterwards she was a healthy married woman.

A tradesman, Jerome Tibbold, was induced, by what he heard of the preceding case, to apply to Cardan for the cure of his own cough, attended by spitting of blood and matter. He was wasted by consumption. Under the new doctor's care he got to all appearance well, and became fat. The physicians said that he could not have had true

consumption, or the man would not have recovered. When Jerome had healed several in this way, he ventured to write that he had cured people who suffered from consumption and oppression of the breath. But as far as concerns the consumptives, he tells us, "the physicians spoke untruly who declared them to be afflicted by diseases of another kind, and I spoke untruly in saying that they were healed. But what I wrote was written in good faith, for I was deceived by hope." After five years, for example, in the case of Tibbold, Cardan explains that the deceptive show of health broke down. Having returned from church upon a holiday in rainy weather, he did not change his wet clothes, but spent the entire night in gambling. His complaint then returned upon him with a fatal violence. He had been once apparently cured by Cardan, once afterwards by another person, but so at last he died of the disease. Upon close inquiry, Jerome was informed by the widow that her husband's cough had at no period been quite removed. Donato Lanza himself, who had considered himself to have been cured by Cardan of a consumption, a few weeks after he had introduced him to Sfondrato, being sought by the authorities for some offence, jumped out of window and fell into a fish-pond, where he brought on himself a recurrence of his malady, and speedy death.

Plainer acknowledgment of error could not be made,

and if Jerome afterwards, handling himself roughly as usual, declares that an important step in his life was determined by the lie he told about the healing of consumptive patients, and that he never profited so much by any single truth as by that falsehood[1], he certainly shows no decrease of candour. Yet mendacity in this instance was one of the great charges made against poor Jerome by his first posthumous critic of any note, Gabriel Naudé[2], who has been followed thoughtlessly by later writers. Bits of truth are the basis of error. Dreadful accounts of Cardan have been founded upon isolated passages found in his works; but from a scrutiny of all the statements made by him about himself, arranged and collated with a fair amount of care, there can result only, as this narrative, if it be worth anything, will show, a confirmation of his claim to be regarded as a scorner of untruth. He does not by any means lay claim to the whole group of cardinal virtues, but he can see through respectability and all its cheats. It may be as much out of the pride of an ill-used philosopher, as out of the spirit of a Christian, that he speaks the truth, but it is truth that he does always speak, and nothing else. "I think," he says, "that

[1] De Libris Propriis. Lib. ult. Opera, Tom. i. p. 136.

[2] "Mendacissimum illum fuisse deprehendi, et ab hoc vitio reliqua demum velut e fonte promenasse, quæ a nonnullis deliramenta vocantur, non levibus de causis existimo." Naudæus in the De Cardani Judicium, prefixed by him to the book De Vitâ Propriâ.

I may call it a virtue never from my youth up to have uttered falsehood[1]." "Beyond all mortals," he says in another work, "I hate a lie[2]." And though he has himself confessed one boyish falsehood, and may have been guilty of dozens while his unformed mind was growing up under corrupt influence, it is not the less consistent with the strongest passion for truth, that Cardan should exclaim out of the energy of manhood, "I do not remember that I ever told a lie, and, to defend my life, I would not do it[3]." We may accept it, therefore, as a fact, that Jerome always speaks literal truth, and generally speaks his mind in plain words, that are only too unguarded. He does not use even the reservation that is necessary to preserve a semblance of consistency before the crowd of casual observers. By making known too much about himself, he only puzzled steady men, with whom it had become a second nature to put out of sight the variations that arise within us all as time runs on, of memory, of mood, and of opinion.

To these considerations we must, however, add the fact that Jerome was by no means perfect in his ethics. Every honest man now holds that words so purposely contrived as to be true in themselves, but false in the impression

[1] De Vit. Prop. cap. xiv.

[2] De Varietate Rerum, Lib. xvi. cap. 93, p. 635 (ed. Bas. 1557).

[3] "Nos autem non recordamur unquam mendacium dixisse, nec si pro vitâ tuendâ dicendum esset, diceremus."

they create, are morally identical with lies. I hold them to be worse. A sudden lie may be sometimes only manslaughter upon truth, but by a carefully constructed equivocation, truth always is with malice aforethought deliberately murdered. The spirit of the Roman Catholic religion in the days when Luther lived, led men to hold a very different opinion on this matter, and Cardan, in his ethical works, has critical chapters on simulation and dissimulation, holding the one to be right, the other wrong. He would disdain to speak untruth, or, indeed, often to suggest it, but he did not think it wrong to circumvent[1]. Three centuries ago that was regarded generally as a lawful and even laudable exercise of ingenuity, if it had any good purpose in view.

While Francisco Sfondrato was engaged actively on his behalf in one way, Jerome was himself engaged in another way, during the year 1538, upon labours that might lead to an improvement of his fortunes. He was about to make his next public appearance as an author. The labours to which he had been stimulated by the lean and hollow-eyed mathematician, Zuanne da Coi, had assisted him to the completion of an elaborate, and in many respects original work on the Practice of Arithmetic. As it would contain many diagrams, and abound in notes, numbers, and novelties, Jerome had determined

[1] See Cardan's De Prudentiâ Civili, chapters 52 and 53.

that it must on no account be printed by his friends at Venice, the brothers Scoto[1]. It must be executed at Milan, under his own anxious supervision. The crabbedness of a handwriting loaded with calculations, lines, and numerals, added to the ignorance or carelessness of printers whose sheets could not be submitted to the distant author for correction, would, if he entrusted his work to the Scoti, result in the publication of a jumble infinitely more distressing to the reader than his first little work issued from the same press, with its hundreds of errata. Not a shadow of the original treatise would remain; labour, money, and the hope of fame would so at once be thrown away. Fortunately there was a bookseller in Milan ready to publish the Plat lecturer's arithmetical treatise at his own expense—nay, more, ready to pay him something—very little, but still something—for the copyright. Jerome Cardan sold, therefore, to Bernardo Caluscho, for ten crowns[2], his *Practica Arithmetice*, and it was imprinted at Milan in the year 1539, by Joannes Antonius Castellioneus, at the expense of the said Barnardinus Caluscus.

To this volume a portrait of its neglected author was prefixed, surrounded by a motto, reminding the unkind Milanese that a prophet is of no esteem in his own

[1] De Libris Propriis (1557), p. 41.

[2] De Libris Propr. Lib. ult. Opera, Tom. i. pp. 103, 104.

country. As this portrait was submitted by Cardan himself to his own townspeople in a book carefully produced, and upon the success of which he felt that much depended, we may accept it fairly as a likeness. It is at any rate quite clear that the artist has not been required to mend the truth in representing the outside appearance of the poor philosopher, and I am not disposed to think that he has marred it[1].

The publication of this book in 1539 formed, as will presently be seen, the turning-point in the life of Cardan as an author. In the same year, also, the dam suddenly gave way by which his course as a physician had been checked. The energetic friendship of Sfondrato had obtained for Cardan the good-will and good offices of another native of Cremona, Giovanni Baptista Speciario, a magistrate in Milan. Speciario was in a position to commend him to the less distant friendship of a patron before mentioned, Alphonso D'Avalos, in 1539 governor of the province. By the influence of all these friends, but by the protests of Sfondrato himself more especially, and of another friend, Francisco della Croce, jurisconsult, an honest man and good mathematician, the physicians of Milan were compelled to sully their respectability by welcoming into their company an ill-born scholar. Thus,

[1] A fac-simile of the old woodcut, reduced in size, has been placed as a vignette upon the title-page belonging to this volume.

in the year 1539, after twelve years of resolute exclusion, Jerome Cardan at last came to be enrolled among the members of the Milanese College of Physicians, and acquired the legal right of practising for fees, or taking office as a teacher in the university

CHAPTER X.

ARITHMETIC AND CONSOLATION.

DESIGNING in this chapter to complete and carry forward the history of the first books published by Cardan, I must go back for the purpose of adding a few facts to the account already given of his earliest printed work. Its full title is "The Tract of Girolamo Castellione Cardano, Physician of Milan, on the Bad Practice of Healing among recent Physicians; to the Illustrious Master Filippo Archinto, Jurisconsult, Imperial Councillor and Governor of the Maternal City of Rome.

"The Tract of the same Author on the Hurt that is in Simple Medicaments. With an Index of those things which are contained in the several Chapters[1]." Ottaviano Scoto's mark, which follows, surrounded by a Fame, is contained between the words of the motto: "Famam extendere factis, virtutis est opus." Then follow the place and date of publication, Venice, 1536. Only one edition

[1] "Hieronymus Castellioneus Cardanus de Malo recentiorum medicorum Medendi Usu Libellus, ad Illustrem Virum D. Philippum Archintum juris-consultus consiliarumq, Cæsureumq; ac Almæ Urbis Romæ Gubernatorem. Ejusdem libellus de simplicium medicamentorum noxa. Cum Indice eorum quæ singulis continentur capitibus." Venetus. 1536.

of this work was printed, Jerome having refused, for reasons before stated, to sanction a re-issue. It is a little square book, closely printed, and containing in all a hundred and ten pages. The main work is dedicated to Archinto; but this dedication contains also a compliment to the physician Ambrose Cavenega, who is excepted from the author's general criticism of the physicians of his time, "for," he says, "the things which give most authority to a physician in these times, are habits, attendants, carriage, character of clothes, cunning, suppleness, a sort of artificial, namby-pamby way; nothing seems to depend on learning or experience." It would be well if this criticism had quite ceased to be applicable. It did not lose its force for at least two hundred and fifty years, and is in our own day only beginning to grow obsolete.

The dedication of his little volume to Archinto, Jerome thus explains: "When I saw that you were foremost in wit, memory, variety of studies, genius, and authority, I judged you to be the best person to whom I could inscribe my first so salutary labours; I was also bound to dedicate them to you by the several employments I have obtained through you in the state; and at the same time invited by your virtues."

The little tract on Simples, occupying the last few pages of the book, is dedicated, as before stated, briefly as possible, to "Ambrose Cavenega, the most excellent doctor of arts and medicine, the most worthy ducal physician."

Passing over the ten pages of Judicial Astrology, published by Jerome on his own account, we come to the Practice of Arithmetic, published in 1539 by Bernardo Caluscho. The book is entitled[1] "The Practice of Arithmetic and Simple Mensuration. By Jerome C. Cardan, Physician of Milan; in which whatever else is contained will be shown on the next page." There are prefixed to it half a dozen lines of alternate hexameter and pentameter, supplied by the Latin poet Annibale della Croce, brother of the Doctor Luca before mentioned. The lines[2], literally translated, are to the following effect: "Many are the uses of numbers, the discriminations of parts, and you may read about them in a thousand volumes. In a little, easy, learned, well-digested book, the sedulous care of Cardan gives them to you here. Read it presently, and you will say that you owe as much to that small book as to the thousand volumes." The book is dedicated by Jerome with the best feeling to his early Milanese friend and patron, the Father in Christ Prior Francesco Gaddi, and in the course of the dedi-

[1] "Hieronimi C. Cardani Practica Arithmetice, et Mensurandi Singularis. In qua que præter alias continentur, verse pagina demonstrabit." Mediol. 1539.

[2] "Multiplices numerorum usus, discrimina parteis.
Queque voluminibus mille legenda tenes.
Exiguo, facili, docto digesta libello.
Hic tibi Cardani sedula cura dabit.
Perlege mox, isti tantum debere libello.
Te dices, quantum mille voluminibus."

cation, looking back to his first luckless venture, the poor author tells how he had been cherishing a "wish among many occupations to have so much leisure as to write a work that could be fairly blamed by none."

Before the index of chapters, there is given in this volume a list of twenty-five new points laid down in the course of the treatise; but as we shall find that a second and maturer work on Arithmetic and Mathematics was published at a somewhat later date, it will be more convenient to postpone for the present what has to be said concerning the claims of Cardan to respect as a great mathematician. It will suffice here briefly to indicate the nature of the book published by Caluscho, and to dwell only upon a certain page or two of characteristic stuff appended to it which belongs immediately to the thread of this narrative, inasmuch as it in fact led to the next great event in Jerome's literary life, and carries on the story from the point reached at the close of the preceding chapter.

Cardan's Practice of Arithmetic is divided into sixty-eight chapters. The first states the subjects to be discussed; the second treats generally of the seven operations of arithmetic; the next four treat of the first of those operations, numeration, as it concerns integers, fractions, surds, and denominations (cubes, figures, &c.) respectively. Four chapters follow devoted in the same way,

one to the treatment of each of the four subjects of calculation by the next of the seven operations, aggregation or addition; the four next are occupied, of course, by detraction or subtraction; the four next by multiplication; and the next four by division, as applied to integers, surds, fractions, and denominations. The four next chapters treat of the extraction of roots; and the next four of progression. The seven elementary operations of arithmetic are thus discussed in thirty chapters. The thirty-first chapter treats of the application of the seven operations to calculations in which there are combined both integers and fractions; the succeeding chapters treat in the same way successively of the seven operations as applied to combinations of integers and surds, integers and denominations, fractions and denominations, fractions and surds, surds and denominations. The thirty-seventh chapter treats of the seven operations as applied to proportion, and of the logical difference between multiplication and division on the one side, and aggregation and detraction on the other. The thirty-eighth chapter discusses astronomical operations; the next, multiplication by memory; the next is a clever dissertation on the kalends, nones, ides, cycles, golden numbers, epact, dominical letter, places of the sun and moon and moveable feasts, with rules for easy mental calculation of most questions arising out of details of the almanac. The forty-first

chapter treats of the value of money; the forty-second treats of mirific numbers, that is to say, of remarkable properties of numbers, natural but strange. The next chapter passes on to the supernatural, and treats of the mystic properties of numbers. Then follows a chapter on irrational quantities; and then Jerome comes to the discussion of the rule of three, which he characterises as the key of commerce—"clavis mercatorum." The next chapter is upon the rule of six, our double rule of three; the chapter following compares the two processes. The treatise then passes in the forty-eighth chapter to the first simple rules of algebra, and travels on to higher mathematical discussions, closing with chapters upon house-rent, letters of credit and exchange, income, interest, profit and loss, games of chance. It then comes to superficial mensuration, and the measuring of solids; passes on to the practical details of weights and measures, and closes with an exposition of certain errors in the works of Luca de Borgo, and a long list of cunningly-devised questions in arithmetic and geometry, calculated to put to a severe test the student's practical acquaintance with the rules and reasons laid down in the book.

While this treatise was at the printer's—and nearly a year seems to have been spent in the printing—the unhappy author was still struggling against contempt and poverty in Milan. Anxious to work a way out of his

obscure position, and to make some approach towards the fame for which he longed, for he was thirty-seven years old and still unrecognised, Cardan proposed to bind up with his second venture as a public author a notice, which was in effect, though not in form, an appeal from his own countrymen to scholars in all quarters of the world. He trusted that the merit of his book, unquestionably very great, would recommend him to men at a distance. Among them, perhaps, when they saw by the motto round his portrait that he was in no esteem at home, and read in the concluding notification how many and divers books that he had written were still left unprinted in his study, there might be one or two who would desire to bring his genius more fully out into the light, and who, for the love of knowledge, would extend to him a helping hand. The notification was of a legal kind, and it is to be found printed in black letter at the end of the first edition of the Practice of Arithmetic. In many parts it is curious, as illustrating not only Jerome's anxiety to escape from the cold and hungry state of a neglected scholar, but also the law of copyright in those days, the small money value set by Cardan on his writings, and the care taken by the Church to provide a censorship which did in fact render impossible the publication of a good many philosophical works. It of course prevented the world at large from being edified or shocked by the

Life of Christ that was completed in 1539, after having been three years in progress. That book was never published; but though not to be read it was abundantly abused by controversialists, who were much scandalised at the one fact of which they were informed by its author, that it set out with an astrological nativity. The notification added to the Practice of Arithmetic was to the following effect:

"Charles the Fifth, Roman Emperor, Ever August, &c. Inasmuch as we have considered the petition of Girolamo Castellione Cardano, Physician of Milan, most faithful servant of the most unconquered Emperor, saying that he has prepared the under-mentioned works in divers faculties to be imprinted in succession according to his convenience, of which two little works have already seen the light; and that he might not be compelled to seek imperial privilege as often as he might have one such work to publish, therefore for the works named below existing in his possession, of which some have already been printed, he desires to obtain an universal privilege: We acquiesce in his humble supplication, and require by these letters that fit and needful help shall be afforded him to prevent any one from printing one of the works named below, or introducing such a work elsewhere printed into any part of the Duchy of Milan, or from committing any fraud against any such work until ten

years after the date of its first publication, under the accustomed penalties according to the imperial pleasure. Of which works the list now follows. (Here follows the list of Jerome's unpublished writings upon divers subjects, thirty-four in number.) In addition to those two which have already been printed: one on the Bad Practice of Healing, and one on the Hurtfulness of Simples.

"For the pleasure or profit of professors of those sciences whereof the above works treat: We concede that they may cause them to be printed either together or in part; except, firstly, that one which treats of the Arcana of Eternity; secondly, that on Death, which is said to contain three books; thirdly, that on Fate; fourthly, that on the Life of our Lord Jesus Christ, also contained in three books: of which we require that they shall first be laid before our senate, that it may be seen whether they are fit for publication.

"Furthermore, we forbid that any man within this our state of Milan shall within ten years print, or cause to be printed, the above works, or any of them, or bring them, or cause them to be brought, from other places into the said state, or have them for sale, against the consent of their author. The penalty for contravention of this our decree shall be ten scudi for each volume of the said works: of which half shall be paid to the author himself, but the remaining half shall be divided between our

exchequer and the informer. This we assure by the present document, which we have commanded to be authenticated by the impression of our seal. Given at Milan, June 25, 1538."

The year 1539, in which Jerome broke through the barrier opposed to his career by the Milanese College of Physicians, and also published his Practice of Arithmetic, which made an easy way for him ever thereafter into the long-sought Paradise of Print, ought to have been foretold to him as a bright year by the stars, if Jupiter had been indeed a conjuror, and Venus had had any right to be regarded as a gipsy. According to his own horoscope, however, Jerome in that year was not very far from death, nor was the world likely to lose much at his decease, if Cheiromancy spoke the truth in calling him a dunce. His head, however, confuted the testimony of his hand. The Practice of Arithmetic, finding its way both into France and Germany, commended its author to the respect of many strangers, and the notification at the end happily produced in one quarter the right effect. To the neglected scholar of Milan there was sent from Nuremberg the offer of Joannes Petreius to print any work which he might be disposed to entrust to him for publication. The offer was transmitted by a learned man of the same town, Andreas Osiander, who undertook to watch through the press, and take careful charge, as local editor, of any work written

by the most learned Cardan, and printed by Petreius. "That," says Jerome, "was the beginning of my fame; of whatever glory I have earned that was the origin[1]."

Osiander was a Lutheran theologian, not very orthodox of his kind, whose name in the vulgar world was Hosemann, as one who may have had an ancestor distinguished for his early assumption of a garment mentionable perhaps in Latin—quasi vir braccatus. He was a man ten years older than Cardan; and having said so much, I may add, that he did not remain to the end of his life at Nuremberg, but spent the last three years of it in Prussia, where he enjoyed court favour as a theologian, and that he died long before Cardan, at the age of sixty-two. He had commenced his public career at Nuremberg as lecturer on Hebrew among the Augustin monks, whose company he had left to preach the new doctrines of Luther. His was the first Lutheran sermon preached in that town,

[1] Speaking of the Practice of Arithmetic for which Caluscho gave him the ten crowns, he says: "Nec si non impressus fuisset nostra monumenta invenissent Typographum: continuò enim, eo opere impresso, cæperunt omnis commutari. Nam adjeceram Catalogum qualemcunque librorum nostrorum, quos vel scripseram, vel cæperam scribere. et liberis distrahi cæpit in Gallilis atque Germanilis. Itaque cum tunc esset Andreas Osiander Norimbergæ, vir Latinæ, Græcæ, Hebraicæque linguæ peritus, tum typographus Joan. Petreius, bonis literis, si quis alius favens, inito consilio totis viribus mecum agere cæperunt, ut aliquid opus illis traderem ut imprimerent. Atque ita initium gloriæ nostræ, si qua deinceps fuit, hinc ortum habuit." De Libris Proprils Lib. ult. Opera, Tom. i. p. 104. The same authority covers the account of the rest of this transaction.

but as he continued to think for himself, he at last gave not less offence to the orthodoxy of the Lutherans than of the Catholics, and lived a life much clouded by controversy, in which he appears to have shown no lack of the usual bitterness and pride. He was well versed in Hebrew, Greek, and Latin, had an inquiring mind, and a decided leaning to philosophy. He was a good mathematician, and, in 1543, the literary spirit which induced his offer to Cardan, caused him to edit, for the first time in Nuremberg, the Astronomy of Copernicus, Petreius printing it[1].

To the request of his new friends at Nuremberg, Jerome replied by sending them an enlarged copy of the tract on Judicial Astrology, which he had published imperfectly, and with too much curtailment, in Milan, at his own expense. Having sent that to be published at Nuremberg, he forwarded nothing else, for a short time, to Osiander and Petreius, for it will be remembered that the Scoti, of Venice, were his friends, and having profited by his first work, they were quite ready to print for him again. Having no friend in Venice competent to correct for him the proofs of any abstruse work, and being greatly

[1] Christoph. Saxi Onomasticon Literarium, Tom. iii. p. 165. Zedler's Universal Lexicon aller Wissenschaften und Künste. Bd. 25. In which last work, under the name of Andreas Osiander, the elder, further details may be found. One of Osiander's works had a curious bearing on the character and spirit of his time; it was entitled, "How far is a Christian justified in flying from the Plague?"

annoyed at the mass of printer's errors in his early treatise, Cardan refused to put his fame in peril by entrusting to his friends any work that contained technical terms and figures. There was no reason, however, why they should not print his Books on Consolation, since there was in them nothing but plain, every-day Latin. Those books, forming the next volume issued by Cardan, were therefore first printed at Venice, and then published as a reprint by Petreius of Nuremberg[1]. This volume, however, was not published until the year 1542; and before more is said of it, the two or three preceding years of its author's literary life should be accounted for.

It should have been said, that in or before the year 1538, Jerome saw in a dream a book painted in three colours—red, green, and gold; he admired greatly its beauty, but he admired still more its contents. From that dream he obtained the first idea of his work on the Variety of Things, published years afterwards, and then commenced[2]. He wrote in that year on Things Above—the rainbow, hail, earthquakes, lightning, &c., and what he wrote was copied out for him by Lodovico Ferrari[3], then residing with him in his house. In the same year he began to write a description of a famous astronomical in-

[1] De Libr. Propr. Lib. ult. Op. Tom. i. p. 108.

[2] Ibid. p. 102. De Lib. Prop. (ed. 1557) p. 28.

[3] De Sapientiâ, &c. p. 428. The same reference provides authority for the rest of the facts stated in this paragraph.

strument showing celestial movements, which having been bought formerly at a high price from the maker by a duke of Milan, had then been taken to pieces, and, after great trouble and discussion, put together again by Ianello, of Cremona. As Cardan could not have the instrument at home with him, he grew tired of that work. In 1539 Jerome finished his three books on the Life of Christ, and arranged two or three books of Letters. The whole of the next year was spent in the revision and emendation of his former writings, one of which, that on Consolation, written in 1537, he prepared next for the press. In 1541, admonished by a dream, he began to work earnestly at Greek literature, and wrote upon the Immortality of the Soul.

"Girolamo Castellione Cardano of Milan his Three Books on Consolation," published at Venice in 1542[1] by one of the brothers Scoto (Girolamo), formed a neat little volume of two hundred and sixty-four pages[2]; and had as emblems on the title-page a Peace instead of a Fame riding the globe, with the motto, *Fiat Paw in virtute tua*— Let Peace come of your virtue. There is a great deal of wisdom in the matter, and of wit in the manner of all

[1] Hieronymi Cardani Castellionei Mediolanensis De Consolatione Libri Tres. Venetiis, apud Hieronymum Scotum, 1542.

[2] One hundred and thirty-two, as figured; the two pages of a book that face each other being accounted one in this as in many other volumes of the time.

Cardan's ethical writings. Though he did not soar far above his neighbours in Latinity, he excelled most in the sterling qualities of mind expressed through the usual barbarous medium, and by force of genius even his sixteenth century Latin is not seldom compelled into phrases terse and inimitable in their way. The Books on Consolation were intended in the writing to console their author under bitter disappointments during his first struggles with an adverse world. "The work was called at first," he says, "the Book of the Accuser, because it contended against the vain passions and false persuasions of mankind: afterwards its name was changed, and it was divided into three books, inscribed as Consolation, because it appeared that there was a far greater number of unfortunate men needing consolation, than of fortunate in need of blame[1]." This passage shows the spirit in which Jerome wrote, how far it was removed from bitterness. He treats in succession of those events which are regarded commonly as the great ills of life, offering upon each many such comments as Epictetus would have heartily commended, fortifying his case with apt illustrations and a great many classical examples, adopting sometimes the language of a Christian,

[1] "Fuerat autem ab initio ejus nomen Accusatoria, ut qui vanos hominum affectus, atque falsas argueret persuasiones: at post mutato nomine, et in tres libellos diviso, de Consolatione eum inscripsimus, quod longe magis infelices consolatione, quam fortunati reprehensione, indigere viderentur." Op. cit. p. 3.

and whether writing in the vein of the old Roman Forum, or the modern Roman Church, always enforcing the opinion, common equally to philosophic heathens and to Christians, that happiness and peace lie not in the world without but in the mind within, and that content is only possible to virtue. This work Jerome dedicates to no one person, because no man would wish it to be published that he is in need of consolation[1]. "It seems," he says very shrewdly, "to be in the grain of men to think themselves more miserable, and to wish to be thought happier by others than they really are."

The gain made by the Scoti on the publication of the "Bad Practice of Healing," was neutralised by loss upon this second undertaking[2]. The title of the book, Cardan thinks, was not liked, nor, perhaps, was the style attractive; and again, the volume was disfigured by the printer with a great number of the vilest blunders. So far as temporary popularity was concerned, the book was very naturally less successful than its predecessor. One touched on

[1] Namque illud naturâ omnibus insitum mortalibus videtur, ut se miseriores quam sint existiment, felíciores vero videri cupiant." Op. cit. p. 2.

[2] After its publication, he writes that Ottaviano held his books in dread: "Neque enim, ut dixi, Octavianus sponte libros meos, neque libenter imprimebat, jacturam veritus impensæ: nam tametsi lucrum fecisset in librorum de Malo Medendi Usu impressione, id tamen in libris de Consolatione postea compensavit: non solum quòd titulus et forsan etiam stylus non arrideret, sed quòd Typographus ipse innumeros atque turpissimos errores imprimendo commisisset." De Lib. Prop. (1557) p. 40.

the material interests of a class, stirred passion, was warmly talked about, and quickly bought; the other touched on the moral interests of mankind generally, was written to allay passion, was coldly talked about, and bought with more deliberation. It was reprinted by Petreius at Nuremberg[1], and grew in credit; it was a capital of fame put out to interest, of which instalments were paid ever after punctually year by year. The little volume came by slow degrees to be accepted as a standard work of its own time, was translated into sundry languages, and twice into our own. The first English translation, entitled Cardanus Comforte[2], was made while Cardan still was living, thirty years after the publication of the book at Venice. The very brief specimen that can be here given of Jerome's style as an essayist and moralist, I think it best to quote from this contemporary version.

It was made by "Thomas Bedingfeld, Esquyer, one of her Maiesties gentlemen pentioners"—her Majesty being Queen Elizabeth—and it was both made at the request and published at the command of the Earl of Oxford "Sure I am," said Bedingfeld, "it would have better

[1] In 1544, together with the books subsequently written, De Sapientiâ, and the first of the three books De Libris Suis, then first printed.

[2] "Cardanus Comforte translated into Englishe. And published by commaundement of the Right Honourable the Earle of Oxenford. Anno Domini, 1573. Imprinted at London in Fleete Streate, near to S. Dunstone's Churche, by Thomas Marshe." Without pagination.

beseemed me to have taken this travaile in some discourse of armes (being your lordship's chiefe profession and mine also), then in philosopher's skill to have thus busied myselfe: yet sith your pleasure was such, and your knowledge in eyther great, I do (as I will ever) most willingly obeye you." But in his modesty he begged of the earl so far to keep his labour secret as "either not to make any partakers thereof, or at the leastwise those, whoe for reuerence to your lordship or loue to mee, will willingly beare with mine errors," &c. &c. To this request the earl replied in an elaborate epistle. "After I had perused youre letters good Maister Bedingfeld, finding in them your request farre differing from the desert of your labour, I could not chose but greatly doubt, whether it were better for me to yelde you your desyre," &c. &c. In fine, he determined to print the book, and bade Bedingfeld be proud rather than ashamed of it, inasmuch as it displayed a kind of gift that "ornifyeth a gentleman." His lordship also called in "Thomas Churchyarde, gentleman," to introduce Cardanus Comforte to the English public with the proper flourish of commendatory verse. Churchyarde first scolded in prose the expected readers of the volume, who, he said, must not go to sleep "and loose but labour with slobberinge handes or head to blot or blemish the beauty of this booke." He then put on his singing robes, and invited them to come for consolation to Cardan in proper form; as for example thus:

"You troubled mindes with torments tost that sighes and sobs consumes:
(Who breathes and puffes from burning breast both smothring smoke and fumes)
Come reade this booke that freely bringes, a box of balme full swete
An oyl to noynt the brused partes, of everye heavye sprete."

I propose to quote from Cardan's work, as Bedingfeld translated it, only the opening and closing paragraphs. They will suffice to convey a very fair impression of the style and temper of the poor philosopher who was so rude and hasty in his speech, yet at the same time always so deliberate and gentle in his writings. The opening sentences remind us of the fact that not long before the writing of this work was commenced, Jerome had occupied himself in reading word by word the whole of the extant works of Cicero. Thus he begins:

"Amonge such and so manye auncient monuments as perished in ye Barbarian warres: would God that at least Marcus Tullius bokes of comforte, written at the deathe of his daughter, had been tyll this day preserued. For as in all other matters hee declared himselfe more then a man, so may it be thought that herein he had written most excellently: the matter being neyther common, fayned or touchinge others, but procedinge from his own naturall affection and extreme perturbation of mynde. And suche is the condicion and qualitie of comfortinge, as al be it no persuation or eloquence were there in used, yet

wanteth it not reason and sufficiente proofe to trye itselfe[1]: wherein so excellente, wise, and eloquente a man as Marcus Tullius having travailed: it muste þe presumed he framed a worke not only worthy prayse, but also aboue all expectacion.

"And albeit those auncient warres have among many other noble workes depriued us of so learned a boke, yet haue we thought mete to entreate thereof (not" [only] "because it is so praisable as amisse it cannot be praysed), but also so necessary" [that] "(as in all thinges whiche of necessitie must be had) better it is to haue any than none at al. For example we see, that houses are nedefull, such as can not possesse ye stately pallaces of stone, do persuade themselves to dwell in houses of timber and clay, and wanting theim, are contented to inhabite the simple cotage; yea rather than not to be housed at all refuse not the pore cabbon, and most beggerly caue. For in these things better it is to have the worst than none at all. So necessarie is this gifte of consolacion, as there liueth no man, but that hathe cause to embrace it[2]. And wel we see ther is none aliue that in every respect may be accompted happie, yea though mortall men were free

[1] "Et se tamen locupletissimam materiam suggerat." It would suggest by itself the richest matter.

[2] I have not altered Master Bedingfeld's translation, which fits admirably to the text; but as he had spoilt this passage so far by the transposition of three sentences, I have restored them to their proper places.

from all calamities, yet the torments and feare of death should stil offend them. But besides them, behold, what, and how manye euilles there bee, that unlesse the cloude of error be remoued, impossible it is to see the truth, or receiue allay of our earthly woes."

After treating in succession of those ills of life most commonly deplored, enriching his text with much shrewd wit, with a great deal of anecdote, and with the proper store of classical quotations and allusions, arguing also sometimes out of a firm belief in curiously false opinions current among men of science in those days, Jerome thus draws his work of consolation to a close. He has throughout taught that the best safeguard against tribulation is to have a clean heart and a busy hand. Urging that fact again emphatically, he passes from the last of human sorrows, death, and ends by leaving man secure from further need of consolation, in enjoyment of that peace which is to be found only beyond the grave. Thus Jerome wrote about Calamity—and thoroughly meant what he wrote—at a time when he himself was bearing much:

" Wherefore to bear everythinge resolutely, is not only the parte of a wise man, but also of a man wel aduised, seinge there is nothing in this life that may iustly be said to be against us. Therefore Homerus fayned Aten the Goddes of Calamitye to be barefooted, as one that could

not touch anything sharpe or hard, but walked lightly upon the heades of mortall men.

"Meaninge that Calamitye durst not come nere anye, but such as were of base minde, simple, and subjecte to effeminacy. But among such as were valiant and armed with vertue, shee durst not come. Wherefore lift up thy mynde to Heaven where an everlastinge and most pleasaunt life is prepared for thee. Men in this worlde are lyke trees[1], some slender, some great, some florishing, some bearing frute, some witheringe, some growinge, some blowen downe, and some frutefull, which in one harueste time are brought togeathers and laide uppon one stacke. Neither is there afterwards sene any difference among them, what they be or haue bene, al at one time be cut downe neuer more to growe agayne. Even so al pryde, ambicion, ryches, authoritye, children, frendes, and glory doe in shorte space grow olde and perishe, neither dothe it make matter whether thou were Irus or vile Galba, Antaxerses or noble Hercules. Onelye honestye and vertue of mynde doth make a man happy, and onely a cowerdlie and corrupt conscience do cause

[1] Cardan's image was taken from the bean-fields; but the translator thinking it a mean thing to compare men to beans, wrote trees, and took away the beauty of the image, substituting the odd notion of trees harvested together, and all laid upon one stack. Thus the passage runs: "Homines enim in hoc mundo ut fabæ sunt,—aliæ enim pusillæ, aliæ magnæ, aliæ florent, aliæ fructibus conspicuæ, aliæ aridæ, aliæ luxuriantes, aliæ exiles, fruticosæ aliæ: omnes tamen unus autumnus quàm brevi in inanes stipulas redigit." De Consol. p. 181.

thine unhappines. Because the worste that the good man can feare, is the best that the evyll can wishe for: whiche is the destruction of the soule in death. But as he ought not to hope thereof, so should not the other feare it. For God the eternal father hath sent us into this worlde as children and heyres of hys kingdome, and secretly beholdeth how we fighte and defend our selves, against our sences, the world and the Devyll. And who so in this battell, valyantly fighteth, shal bee called and placed among the Prynces of heauenlye kingedome. And who so slothfully or cowerdly behaueth himself, as a slave in featres shall for evermore be bounde.

"This worldly stage was purposely prepared, that God the father might secretlye beholde us. Such foolishe children then, as in his sighte wantonlye, slouthfully, and sedicioustye lyve, shoulde they not thinke he doth beholde them. When so ever therefore thou haste taken that last leaue of Life[1], thy soule like unto a lover embracinge his death, shall enjoye that sweteness and security, whyche we can neither wryte of nor conceive. For sith these worldlye lovers (amongest whom be many

[1] In Cardan's words the succeeding image is expressed more strongly than by the translator. "Cum itaque strenuum agonem anima superaverit, tam quam amans amanti copulata, eâ dulcedine ac securitate fruitur, quam nec scribere, nec cogitare possumus," &c. p. 132. To the brief account of Cardan's books on Consolation given in the text, it will perhaps be well specially to add, that although in some parts occupying the same ground, they do not resemble, or equal, the five books of Boëthius on the Consolations of Philosophy.

mislykings without assurance or eternity) can scarcely expresse their joyes in loue: Happy, yea thrise happy is this heauenly lover, who forgettinge all others, wythe his one love is united. For within this kingdom he loveth and liueth in the sight of him, that can do all thinges, and therefore lyke a good sonne to his father is ever readye to do his pleasure."

So wrote the first among the atheists of the second order.

CHAPTER XI.

THE WOLF AT THE DOOR.

JEROME certainly was not living a brilliant life before the world when his three books of Consolation were first issued to the public. After the events of the year 1539 he began to breathe; but it was not until four years afterwards that he experienced any real change of fortune. The stars were supposed to have predicted that his death would take place before he reached the age of forty, certainly before he should attain to the full age of forty-five; "but," says Cardan, "it was when I ought to have died that I began really to live[1]." The error lay of course, however, not with the stars, but with the imperfect readers of their language.

At that time which should have been the close of his

[1] "Et astrologiæ cognitio quam tunc habebam, et ut mihi videbatur et omnes aiebant, me non excessurum xl. vitæ annum, certè non ad xlv. perventurum multum obfuit. Ego interim partim necessitate, partim offerentibus se voluptatibus quotidie, cum rectè vivere deliberarem, delinquebam. Negligens ob malam spem res ipsas: in deliberando aberrabam, et frequentius in opere peccabam. Donec eo ventum est, ut qui finis vitæ futurus credebatur, vivendi initium fecerit, xliii. scilicet annus." De Vit. Prop. p. 44.

life, the house he occupied belonged to his mother, who lived with him; it was a house near the church of St. Michael. He earned very little indeed as a physician, but something as an almanac-maker—something by the sale of astrological opinions; a little help he had occasionally from his friend Archinto, and a friend who belonged to the household probably paid her way in it as a lodger[1]. With these resources and the Plat lectureship he kept house as he could. There was the resource also of the gambling-table.

Though the Milanese College of Physicians so far honoured the recommendations made in favour of Cardan, that already in the year 1541 we find him in office as its rector[2], it does not appear that Jerome troubled himself much to acquire a social standing that consisted with his newly-acquired privileges. In that year, 1541, he was scarcely practising at all; his energies were all spent upon Greek and gambling. Neither in that year, nor in the year preceding, had he worked much with his pen. In 1540 he had found leisure as an author for no more than the correction of his previous books. In 1541 he wrote

[1] De Vitâ Propriâ, cap. xxv. p. 95, for the preceding.

[2] He states the fact incidentally in the history of a case attended by him in that year. De Vit. Prop. cap. xxx. The servant of a Genoese colonel came from Switzerland, where he had slept between two men who subsequently died of plague, and had himself taken the infection. Cardan found him not dead, but apparently so, and the colonel urged that he should at once be carried to the dead-house. Cardan would not permit that. The man recovered.

something about the Consolation of Lovers and the Immortality of the Soul. At Greek he did work. In the last-named year, being admonished by a dream, he betook himself to the study of that language with so much earnestness of purpose, that the smattering which he had begun to acquire six years before, and beyond which he had not passed, was in four months enlarged into a considerable acquaintance with the language; he became able to understand it so well that he might read for hours without being checked by any difficulty, and spent time in writing Greek, not, he says, as a sign of scholarship, but of the energy with which he studied[1].

During these years, 1540 and 1541, and during the first part of the year 1542, Jerome allowed all other work to fall into neglect, because the Fates had sent to him a golden goose[2]. Antonio Vicomercato, a patrician of Milan, was inclined to amuse himself daily with the poor mathematician and physician over the dice-table, very well content to lose. Cardan of course was alike glad to play at dice, and glad to win. He went to Antonio's house daily, and stopped often the whole day; they played for from one to three or four reals a game, and as

[1] "Non enim veteranus, sed tyro militabat, tum maxime *aἰτοδίδακτος* existens. Expressi ibi vim non eruditionem." De Sapientiâ, &c. pp. 429, 430. The reference substantiates the account given in the text of Cardan's literary work in the years 1540—41.

[2] All that relates to Vicomercato will be found in the 38th chapter of the book De Vitâ Propriâ.

Jerome always rose a winner, he was able to take home about a gold piece daily, sometimes more and sometimes less. For two years and some months almost all other sources of income dried away from him, while he cultivated this. His credit sank; even pen, ink, and paper were neglected.

With money so earned, or with money however earned, in the midst of his poverty he was improvident. He enjoyed musical evenings, and music, as he said, led to unprofitable company. The taste of the period was for part-singing, and it was not easy to collect four or five men who could sing readily together, and who could think and feel together also. If he had musical companions to his house they cost him heavily for suppers, and corrupted the minds of his children. For most singers, he said—and I suspect that he could not easily libel the good table-companions of the sixteenth century—most singers are drunken, gluttonous, impudent, unsettled, impatient, stolid, inert, ready for every kind of lust. The best men of that sort are fools[1]. Upon such men, despising them but relishing their music, Cardan squandered a good deal of his money.

One day, at the end of August (1542), Vicomercato announced a sudden change in his own life, and he was not to be satisfied unless Cardan would swear—as he did

[1] De Util. ex Adv. Cap. Opera, Tom. ii. p. 117.

swear by all the gods—never to come to him again for the purpose of dice-playing. Jerome took wholly to study, but his golden goose was dead, and his penury was sudden and extreme. He had neglected all legitimate resources. We can scarcely doubt the object of the trip to Florence which immediately followed, since we are told that he went to join the free-handed Marquis d'Avalos. D'Avalos, Marquis del Guasto, was always even more ready to give than Cardan to take; he offered in the course of his intercourse with the philosopher, by whom he had been courted, more than Jerome thought it proper to receive, but he had received from D'Avalos some help, and that not inconsiderable[1]. On his way home he visited his patron Sfondrato, who was then Governor of Sienna. Then he came back to Milan, fortune frowning[2].

While matters were in this state with Cardan, fortune was, as usual, frowning upon Italy, and the distracting wars of which the traces lie about this narrative, as they must leave marks on the life of almost every man who

[1] "Sua eccellentia è di prima di Millano di dottrina, ed il Marchese dal Vasto gli ha dato una gran provisione per la sua sofficientia," said Cardan's agent to Tartaglia in 1539. Quesiti et Inventione diverse, p. 116. This will be discussed in the next chapter. See also De Vitâ Propriâ, cap. iv.

[2] De Libris Propriis. Liber ultimus. Opera, Tom. i. p. 106.

worked in that most miserable age, compelled a removal to Milan of the University of Pavia[1]. As the same wars crippled the university funds, and the professors could not get their salaries, very few of them thought it worth their while to come to Milan with their chairs; many chairs, therefore, were vacant, and among them that of Medicine, which was again offered by the senate to Cardan[2]. He had before refused it, because he did not think the salary secure; when, however, the office was brought home to his own door, at which the wolf was sitting all day long, the poor philosopher thought very wisely, that even to have money owing to him would beget a financial state much more respectable than hopeless want; there was also a decided gain of respectability in point of position. The Plat lectureship only required his services on holidays, and was no introduction to a regular professor's chair. As for his duties to the University of Pavia, while its lectures were delivered at Milan they would not take him far out of his way, or require the abandonment of any of his home resources. He could cultivate his practice, indeed, all the more easily for holding rank in his own town as a Professor of Medicine as well as Mathematics. Work he must, for at this time a

[1] De Libris Propriis. Liber ultimus. Opera, Tom. i. p. 106.

[2] De Vitâ Propriâ, cap. xxxvii.; where will be found authority for all that follows on this subject.

third child was born to him, a boy, whom he named Aldo[1].

He therefore accepted office, and delivered lectures, like his colleagues, to bare benches until the conclusion of that academic year[2]. The academy proposed then—the tide of war having retreated—to return to its own groves, and Cardan certainly did not propose to go to Pavia with it, deterred by the old reason, the broken fortunes of the place, and the extreme uncertainty connected with the stipends payable for teaching. Quite prepared to remain where he was, Jerome went to bed as usual on the night before he was to return his answer to the senate, which required to know whether he would abide by his professorship and teach in Pavia. He went to bed in the usual way with his wife, his eldest boy, Giovanni Batista, ten years old, and Aldo, the baby, all under one cover; but wonderful to relate, on that night the house tumbled down. Nobody was hurt, but his home in Milan being thus suddenly and literally broken up, as he believed of course, by a special and miraculous dispensation, he changed the tenor of his answer to the senate, and in the year 1544 consented to remove.

The salary to be received by him at Pavia would be two hundred and forty gold crowns[3]. For the anxiety shown

[1] De Vitâ Propriâ, p. 20. [2] Ibid. cap. vi.
[3] De Lib. Propr. Op. Tom. i. p. 108.

by the senate to retain his services, and for his first appointment as a teacher in the university, Cardan knew himself to be indebted to his patron, Cardinal Sfondrato, who had by good chance returned to Milan, and assisted his much-trusted physician in the hour of need[1].

[1] De Vitâ Propriâ, cap. xv.

CHAPTER XII.

OF THE GREAT ALGEBRAIC QUARREL THAT AROSE BETWEEN MESSER HIERONIMO CARDANO AND MESSER NICOLO TARTAGLIA—WHAT LETTERS PASSED, AND HOW TARTAGLIA FELT THAT IT WAS DUE TO HIMSELF TO MAKE THE CORRESPONDENCE PUBLIC.

Busy and restless, never spending his time wholly upon one pursuit, Jerome, in his mature years, led a life of which the annals would be now and then distracting if they were too strictly told off year by year. The events, therefore, of the period between the years 1539 and 1545, with which we are at present occupied, I think it best to group according to their nature. Of his public literary life up to the year 1542, and of his domestic life to the end of the year 1544, sufficient account has now been given. In the year 1539, however, there commenced a connected series of studies and endeavours that were concurrent with a multitude of other labours, and that remained private until the year 1545. They then resulted in the publication of a book, which was, in fact, Jerome's greatest work, and which must at all times form an important topic in

connexion with the history of Mathematics. The whole story of this book I shall attempt now to tell in a connected way. The work in question is Cardan's Book of the Great Art—his Algebra—a volume so especially important, and begotten in so quaint a way, that whether I wished this narrative to be read chiefly for information or amusement, it would equally be fit that it should therein be put prominently forward.

That a long chapter upon Algebra should be one of the most essential parts in the biography of a physician, is a fact perfectly characteristic of the state of learning in the sixteenth century. Physic was then allied not only with chemistry, but had an alliance equally strong with alchemy, astrology, and mathematics. There is a relic of this old state of things left to us in the continued imputation of a well-known astrological almanac to Francis Moore, Physician. The first book of algebra published in this country, entitled the Whetstone of Witte, which is the seconde parte of Arithmetike, by Robert Recorde, describes its author (he died in the Fleet Prison) as "teacher of mathematics and practitioner in physic at Cambridge[1]." A more

[1] Robert Recorde taught mathematics at Oxford, and was admitted to practise physic afterwards at Cambridge. I cannot precisely verify the above reference, which I adopt from Hutton's Mathematical Dictionary; it may be correct. In the first edition of "The Whetstone of Witte"—the only one I have seen—the author, whose name is not on the title-page, writes himself in the dedication, "Robert Recorde, Physitian," only. He was a man abounding in inventions, the first ven-

striking illustration of the intimate connexion that existed formerly between these sciences, is to be found in that part of Don Quixote which relates how the bachelor

turer in many arts. Poor fellow! He, if not his teaching, fell among thorns. Soon after the publication of the Whetstone, he died in gaol for his poverty. In England, at any rate, they were not in those days the learned who grew rich. At the close of the preface to this book he deprecated hasty criticism; for, he said, "by occasion of trouble upon trouble, I was hindered from accomplishing this worke, as I did intende. But yet is here moare, then any manne might well looke for at my hands, if thei did knowe and consider myne estate." The abrupt close of the book (it is all written in English dialogue) is very touching, and may awaken now, three centuries too late, many a warm feeling of sympathy. An abstruse dissertation upon Universal Roots is suddenly thus interrupted:

"MASTER. You saie truth. But harke, what meaneth that hastie knockyng at the doore?

SCHOLAR. It is a messenger.

MASTER. What is the message? tel me in mine eare.

Yea, sir, is that the matter? Then is there no remedie, but that I must neglect all studies and teaching, for to withstande those daungers. My fortune is not so good, to have quiete tyme to teache.

SCHOLAR. But my fortune and my fellowes is much worse, that your unquietnes so hindereth our knowledge. I praie God amende it.

MASTER. I am inforced to make an eande of this mater: But yet will I promise you, that whiche you shall chalenge of me, when you see me at better laiser: That I will teache you the whole arte of universall rootes. And the extraction of rootes in all square surdes, with the demonstration of theim, and all the former woorkes.

If I might have been quietly permitted to reste but a little while longer, I had determined not to have ceased till I had ended all these thinges at large. But now, farewell. And applie your studie diligently in this that you have learned. And if I maie gette any quietnesse reasonable, I will not forget to performe my promise with an augmentation.

SCHOLAR. My harte is so oppressed with pensivenes, by this sodaine unquietnesse, that I can not expresse my grief. But I will praie, with all theim that love honeste knowledge, that God of his mercie will sone ende your troubles" (soon, indeed, in death), "and graunte you suche

Samson Carrasco, being thrown from his horse by the knight, and having his ribs broken, sent—it is said quite naturally—for an algebrist to heal his bruises[1]. Keeping in mind this old association of ideas, we find that there was nothing exceptional in the position of Cardan as teacher of mathematics and practitioner in physic, nothing odd in his combination of the callings of an almanac-maker, an algebrist, and a physician.

Robert Recorde's book, just mentioned, was published in 1557, and as Cardan's book of the great art was then already twelve years old, it may be justly inferred that Cardan was one of the first European writers upon algebra. It is necessary that we should now understand

reste as your travell doth merite. And all that love learnyng say thereto, Amen.

Master. Amen, and amen." They were the last words he printed.

Robert Recorde's books had quaint titles, fanciful and witty, sometimes half-metrical, prefaces, and had bits of his verse scattered upon the front of them. The spirit of the title to the work mentioned above may be briefly expressed in four lines writ on the title of a previous book, The Pathwaie of Knowledg:

"*Geometris's Verdicte.*
All freashe fine wittes by me are filed;
All grosse, dull wittes wishe me exiled.
Though no mann's witte reject will I,
Yet as they be, I wyll them trye."

[1] "En esto fueron razonando los dos hasta que llegaron á un pueblo donde fué ventura *hallar un Algebrista con quien se curo el Samson* desgraciado." D. Quijote. Part. ii. cap. xv. I was directed to this passage by Hutton's Mathematical Dictionary, article Algebra. The general information contained in this chapter is chiefly derived from the same source, and from Montucla's History of Mathematics when no other authority is cited.

somewhat accurately his true place in the history of that science. Of the antiquities of algebra nothing need here be said, unless, perhaps, it is worth while to note that the art probably was born in Hindostan, and that its present name is that given to it by the Arabs, through whom it reached Europe. The Arabic name "al-jebr" is a term which denotes one method of reducing equations, namely by transposing or adding the negative terms so as to make them all affirmative. From the Moors algebra came first into Europe by way of Italy and Spain. The first person known to have brought the art into Italy—before there existed printed books—was Leonard Bonacci, of Pisa, who composed an arithmetic in the year 1202, and wrote more on the subject twenty-six years afterwards, adding some information upon algebra, the knowledge of which extended then only to the solution of equations of the first and second degree. Bonacci's language was a barbarous mixture of Latin with Italian, and there was in his time no notation by the use of signs. From Pisa the art spread through Tuscany and Italy, so that there were authors who obtained much reputation in it before there was any press from which their works could issue.

The first printed author upon algebra[1] was a cordelier,

[1] After the discovery of printing, in mathematics, as in other departments of learning, the press was at first employed chiefly in the reproduction of the writings of the ancients. In 1505, Luca de Borgo translated Euclid. In 1518, Plato of Tivoli translated the Spherics of Theo-

or minorite friar, Luca Paccioli, commonly called Fra Luca di Borgo, of Borgo San Sepolcro. He is the same Fra Luca whose errors Cardan pointed out in his "Arithmetic." Luca di Borgo had been trained at Venice by Domenico Bragadini, and having increased his knowledge by long travel in the East, taught his science afterwards at Naples, Venice, and Milan, in which last place he was the first who filled a chair of mathematics. It was founded for him by Lodovico Sforza. He had many disciples, whom he names in his works. He translated Euclid into Latin; or, more properly speaking, he revised the already existing translation of Campanus, and augmented it with notes. He also wrote several treatises, that were printed between the years 1470 and 1494, the last being entitled (in the second edition) "Summa de Arithmetica, Geometria, Proportioni è Proportionalita, nuovamente impressa in Toscolano su la riva dil Benacense e unico carpionista laco: amenissimo sito," &c., the rest of the title-page is further praise of the place in which the good monk had resided during the printing of his book; the same lake of Benacum, or Lago di Guardo, in which Cardan,

dosius. Memmius, a noble Venetian, translated at the same time Apollonius. Venatorius (Jäger?) and Herweg, printers of Basle, published in 1544 a Latin translation of Archimedes and his commentator Eutochius. Tartalea, in 1557, translated the fifteen books of Euclid into bad Venetian Italian, with a commentary. See Montucla's Histoire des Mathematiques, vol. i. bk. 3.

during his student days, was nearly drowned. It will be remembered that Cardan related how, at supper, after their escape, he was the only one who had a ready appetite for the fine pike that was brought to table. Fra Luca, with a clerical enjoyment of good living, took so heartily to the fine carp of the lake, that he could not forbear from making honourable mention of them on his title-page; indeed, the directing attention to the carp, and the antiquities of the locality, occupies more space there than the actual naming of the book[1].

In the time of Luca di Borgo, the great art extended to

[1] The preceding details concerning Luca di Borgo are drawn from Montucla, Hist. des Mathematiques. Paris (an vii.), vol. i. p. 549. The first edition of the book referred to in the text being very scarce, Montucla had not seen it. Copies of both the first and second editions (the latter with its curious title-page deficient) are in the British Museum. The first was printed at Venice in 1494, before Brother Luke had made acquaintance with the carps of the Lago di Guardo. It is entitled simply, "Summa de Arithmetica, Geometria, Proportioni è Proportionalita," and has the contents printed on the title-page. The title-page to the second edition is formed in precisely the same way, with this interpolation, "Nouamente impressa in Toscolano su la riua dil Benacense et unico carpionista Laco; Amenissimo Sito: de li antique ed euidenti ruine di la nobil cita Benaco ditta illustrato: Cum numerosita de Imperatorij epitaphij di antique e perfette littere sculpiti dotato: e cum finissimi e mirabil colone marmorei: innumeri fragmenti di alabastro porphidi e serpentini. Cose certo letto mio diletto oculata fide miratu digne sotterra si ritrouano." The date of this second edition is 1523, so that Brother Luke's enthusiasm on the subject of the carp, and of the fine remains of the old city of Benacum on its shores, was being excited at about the same time when Cardan and his companions broke their mast upon the lake, and supped upon a pike at Sermione. Of the imperial inscriptions, the fine marble columns,

quadratic equations, of which only the positive roots were used; there was but one unknown quantity assumed, and there was no use made of marks or signs, except a few abbreviations. Algebra was then used only for the solution of a small class of numeral problems.

In or about the year 1505, the first rule for resolving one case of a complex cubic equation ($x^3 + bx = c$) was discovered by Scipio Ferreus, of Bologna. This is the discovery to which a reference was made at the beginning of the ninth chapter of the present work; and from this point the history of Algebra in Italy has an immediate bearing on the story of Cardan. Ferreus taught his rule to a pupil named Antonio Maria Fior (Latinised, Florido, or, we should say in English, Flower), who, thirty years afterwards, presuming on his knowledge of it, challenged and triumphed over his contemporaries. It was at that time usual for men skilled in any art or science to send tough questions to each other for solution, and to provoke each other to stake money or reputation upon intellectual encounters. The advancement of learning was unquestionably hastened by such means. Master Flower's unanswerable problems, and the pains he took to flout his knowledge of a secret rule in the face of his brother mathematicians, caused him to be rather trouble-

the innumerable fragments of alabaster, porphyry, and serpentine, to which Fra Luca called attention, no trace, I believe, remains to excite notice in the present day.

some. Antonio Maria Fior, who was a Venetian, at last, in 1535, provoked into a wager a hard-headed man of Brescia, Nicolo Tartaglia, then resident in Venice. Each algebrist was to ask of the other thirty questions; and he who had first answered the questions put to him should win from the other as many entertainments for himself and friends; it was a bet, in fact, of thirty suppers. Plenty of time was given for the concoction of the problems, and a distant day fixed upon which the match was to come off.

Tartaglia (Latinised, Tartalea) was a hard-headed man. He was born of a very poor and humble family. His father, Michele, was known only by his Christian name, or rather by its diminutive; for being a very little fellow (the son, Nicolo, was little too) he was called Micheletto; —Micheletto the Rider, since he was a postman. He kept a horse, and his business was to carry letters from the noblemen and gentlemen of Brescia—the town in which he lived—to Verona, Bergamo, and other towns. Micheletto was an honest little being, who contrived to find rude schooling for his children; Nicolo, therefore, when four or five years old, had some instruction. But it was only in his early childhood that he had it, for when he was but six years old his father died, leaving him with a brother older than himself, a younger sister, and a widowed mother in the extremest poverty. When afterwards the

French, under Gaston de Foix, sacked Brescia[1], the poor widow, with Nicolo and her little daughter, fled for refuge, following a crowd of helpless men, women, and children into the cathedral. There, however, they were not entirely safe; and Nicolo, a boy of twelve, received five sword wounds upon the head that were almost mortal—three upon the skull and two upon the face. The stroke upon the face cleft both lips, struck through his upper jaw into the palate, and broke many of his teeth. Having those wounds he could not speak, or take any but liquid food. His mother took him home, and, being much too poor to pay a surgeon or to buy ointments, treated him herself upon a system which she borrowed from the dogs. Knowing that the whole system of canine surgery consisted in incessant licking of all wounds, she supposed that she might heal her son by frequent washing and most scrupulous regard to cleanliness. Under such care from his mother's hands, Nicolo's wounds did really heal in a few months, leaving scars, he tells us, that would afterwards have made a monster of him, if they had not been covered by his beard. The boy, when recovered, was for a long time so hardly able to pronounce his words, that he was called by his young companions "Tartaglia," stutterer; and as his father had not transmitted to him any

[1] The sack, it may be remembered, lasted seven days, during which the French boasted of having slaughtered indiscriminately forty-six thousand inhabitants.

known family name, he was content to adopt, seriously, the nickname given to him, as a perpetual memorial of his misfortune.

The mother of Tartaglia was unable to provide for him any instruction. Therefore, when he was about fourteen years old, he put himself to school to learn to write, and in fifteen days learnt to make letters as far as k, but there his schooling ended. The schoolmaster's first copy-book reached only to k; when that was finished by a pupil he received another, upon which were the remaining letters. Nicolo had put himself to school without the means of paying for instruction, so that the fifteen days represented the extent of his credit; that being exhausted, since he had no money, he had nothing more to spend, and very properly retired. He contrived to go away, however, with the master's second copy-book, out of which he taught himself, and which he did not afterwards return. In plain words, he stole instruction in the rudiments of writing. From that day he declares that he had no other teaching than what he could get through the help of a daughter of Poverty, called Industry[1].

[1] The above sketch of the early life of Tartaglia is taken from the autobiographic details given in his own work, "Quesiti et Inventioni Diverse de Nicolo Tartalea Brisciano," Venice, 1546, where it occurs in a dialogue between himself and the Prior di Barleta. Lib. vi. Quesito 8, pp. 75, 76. The end of it, "da quel giorno in qua, ma piu fui ne andai da alcun precettore, ma solamente in compagnia di una figlia di poverta, chiamata industria," is at variance with the details

Tartaglia carried his own tale no further; others, however, who were his neighbours, have done that for him; and, if their report be true, he was not so entirely self-instructed as he claimed to be. In any case, there can be no doubt that he may still fairly enough be said to have become wholly by his own exertions a distinguished mathematician, as it is also certain that he grew to be like many other self-taught men, rugged and vain. It is said of him, that, in the year 1499, by the earnest entreaties of his mother, who could not support him, he was taken to study at Padua by Lodovico Balbisonio—a noble youth of his own town. That he returned to Brescia with his patron, and there showed himself to be so avaricious, so morose, and rude, that he was hated by his fellow-citizens. That being obliged to quit them and to live elsewhere, he travelled and made money; thriving especially at Venice. That he returned to Brescia to teach Euclid, but that again his fellow-townsmen would not tolerate him, and that thereupon he again went to Venice, prospered, and died old. He did not acquire any command over Latin; and when he wrote, it was in his own bad Venetian dialect. He must, however, have known how to read, although he did not trust himself to write the learned lan-

which follow, for which I am indebted to Papadopoli, Gymn. Patav, vol. ii. pp. 210, 211. Papadopoli—whose little biographic sketches of men who have been connected with his university, are by no means always accurate—cites Rubeus, one of Tartaglia's contemporaries, a writer very well acquainted with Venetian affairs and people.

guages, for he translated Euclid, and was compelled to study Latin works on mathematics.

Tartaglia then, settled in Venice, set to work with all his might to prepare himself for his contest with the before-mentioned Antonio Maria Fior; and while in bed one night, eight days in advance of the time of meeting, he thought out his rival's secret; discovering not only the rule of Scipio Ferreus for the case $x^3 + bx = c$, but also a rule for the case $x^3 = bx + c$. He prepared himself accordingly. He took care to propose for the perplexing of his antagonist several problems that could be solved only according to the latter rule, then first discovered by himself. The questions put to him in return he knew would hinge upon the rule of Ferreus. The event proved that he was right; and when the day of trial came Tartaglia answered all the questions on the list presented to him by his adversary in two hours, before Florido had solved one of the problems offered to him. The victor waived his right to thirty entertainments, but achieved a lasting triumph.

These rules were discovered by Tartaglia on the 12th and 13th of February, 1535. Five years earlier he had discovered two other rules (for the cases $x^3 + ax^2 = c$ and $x^3 = ax^2 + c$) on the occasion of questions proposed by a schoolmaster at Brescia, Zuanne da Coi (which would in English be, John Hill).

Except these discoveries, there was nothing in the

mathematical knowledge or doctrine of Tartalea which placed him in advance of other scholars of his time. He understood thoroughly the mathematical knowledge of his day, and used it very skilfully. His new rules concerning cubic equations he maintained as his private property, cherishing them as magic arms which secured to him a constant victory in algebraic tilts, and caused him to be famed and feared. That was a selfish use to make of scientific acquisitions, with which no scholar of the present day would sympathise, and which, also, in the sixteenth century, would have been thought illiberal by students like the pattern man of letters, Conrad Gesner, or even our erratic and excitable Cardan.

Cardan, when his work upon arithmetic approached completion, made an attempt to procure the publication of Tartalea's rules. Four years had elapsed since the famous contest of Tartalea with Fior (or Florido), when, in the beginning of 1539, Cardan applied through a bookseller to the victor, with compliments, and a submission of critical problems after the customary fashion. Then there were sown the seeds of a great quarrel, the growth of which Tartalea himself has chronicled with jealous care.

It should be understood that not many months before the commencement of the correspondence between Nicolas Tartalea and Jerome Cardan, Tartalea had published a

small tract at his own expense on the New Science of Artillery (its preface is dated December 20, 1537)[1]. He was indeed one of the first men who perceived that there was any science to be taught at all to men having the care of cannon. Another and larger original work was published, also at his own expense, in the year 1546, at Venice, where he lectured publicly on mathematics. It is entitled Divers Questions and Inventions[2], is dedicated to our Henry VIII., and contains nine books, which are, in fact, the diary and commonplace-book of his life as a mathematician. In it are set down, year after year as they came, the questions proposed to him at different times by friends and rivals on mechanics, statics, hydrostatics, &c., during twenty years ending in 1541. It con-

[1] "Nova Scientia inventa da Nicolo Tartalea B." The title-page is chiefly occupied by a large plate, which represents the courts of Philosophy, to which Euclid is doorkeeper, Aristotle and Plato being masters of an inmost court, in which Philosophy sits throned, Plato declaring by a label that he will let nobody in who does not understand Geometry. In the great court there is a cannon being fired, all the sciences looking on in a crowd—such as Arithmetic, Geometry, Music, Astronomy, Cheiromancy, Cosmography, Necromancy, Astrology, Perspective, and Prestidigitation! A wonderfully modest-looking gentleman, with his hand upon his heart, stands among the number, with a you-do-me-too-much-honour look upon his countenance; Arithmetic and Geometry are pointing to him, and under his feet his name is written—NICOLO TARTALEA.

[2] "Quesiti et Inventioni Diverse de Nicolo Tartalea Brisciano." —"Stampata in Venetia per Venturino Ruffinelli ad instantia et requisitione, et à propria spese de Nicolo Tartalea Brisciano Autore. Nel mese di Luio L'anno di nostra salute. M.D.XLVI."

tains forty-two dialogues, in the last of which one speaker is Mr. Richard Wentworth, an English gentleman who had been taught by Tartalea at Venice. Among other matter in the ninth book of this volume is the record kept by the jealous Nicolo of all his early dealings with Cardan, minutes of conversations and copies of correspondence which he there printed, as he threatened that he would, when he considered himself to have been grievously ill-used by Jerome, as a way of publishing his misdeeds to the world. The chronicle begins with Jerome's application before mentioned, of which Tartalea had made in his diary an ample memorandum in the manner following: (I should explain that two old terms employed in mathematics, where they occur occasionally, in the course of this correspondence, I have thought it proper to retain. The quantity represented now by x used to be called the cosa, or in Latin, res, and x^2 was known as the census.)

"*Inquiry made by M. Zuan Antonio, bookseller, in the name of one Messer Hieronimo Cardano, Physician and public reader of Mathematics in Milan, dated January 2nd, 1539*[1].

ZUAN ANTONIO. Messer Nicolo, I have been directed to you by a worthy man, physician of Milan, named Messer

[1] Op. cit. Lib. ix. p. 115.

Hieronimo Cardano, who is a very great mathematician, and reads Euclid there in Milan publicly, and who is at present causing to be printed a work of his on the Practice of Arithmetic and Geometry and Algebra, which will be of some note. And because he has understood that you have been engaged in disputation with Master Antonio Maria Fior, and that you agreed each to propose thirty cases or questions, and did so; and his excellency has understood that the said Master Antonio Maria proposed to you all his thirty which led you in algebra to a case of the cosa and cube equal to the number. And that you found a general rule for such case, and by the so great strength of your invention you had resolved all the said thirty questions proposed to you at the end of two hours. Therefore his excellency prays you that you will kindly make known to him that rule discovered by you, and if you think fit he will make it public under your name in his present work, but if you do not think fit that it should be published he will keep it secret.

NICOLO. Tell his excellency that he must pardon me; when I propose to publish my invention, I will publish it in a work of my own, and not in the work of another man, so that his excellency must hold me excused.

ZUAN ANTONIO. If you object to make known to him your discovery, his excellency has bidden me to pray that you will, however, give him the said thirty questions

that were proposed to you, with your resolution of them, and at the same time the thirty questions that were proposed by yourself.

NICOLO. I cannot do that, because as soon as he shall have one of the said cases with its solution, his excellency will at once understand the rule discovered by me, with which many other rules may perhaps be found, based on the same material.

ZUAN ANTONIO. His excellency has given me eight questions to give you, praying that you will resolve them for him. The questions are these:

1. Divide me ten into four parts in continued proportion, of which the first shall be two.

2. Divide me ten into four parts in continued proportion, of which the second shall be two.

* * * * *

6. Find me four quantities in continued proportion, of which the second shall be two, and the first and fourth added shall make ten.

7. Make me of ten three parts in continued proportion, of which the first multiplied by the second will make eight.

8. Find me a number which multiplied by its root plus three will make twenty-one.

NICOLO. Those are questions put by Messer Zuanne da Coi, and by no one else. I know them by the two

last, because a similar one to that sixth" [seventh ?] "he sent to me two years ago, and I made him confess that he did not understand the same, and a similar one to that last (which induces an operation of the square and cube equal to the number) I gave him out of courtesy solved, not a year ago, and for that solution I found a rule specially bearing upon such problems.

ZUAN ANTONIO. I know well that these questions were given to me by his said excellency, Messer Hieronimo Cardano, and no other.

NICOLO. Then the said Messer Zuanne da Coi must have been to Milan and proposed them to his excellency, and he, being unable to resolve them, has sent them to be worked out by me, and this I hold for certain, because the said Messer Zuanne promised me a year ago that he would come here to Venice, but for all that he has never been, and I think he has repented of his purpose and given its turn to Milan.

ZUAN ANTONIO. Do not think that his excellency would have sent you these problems if he had not understood them and known how to solve them, or that they proceed from another person, for his excellency is one of the most learned men in Milan, and the Marquis dal Vasto has given him a great provision for his competency.

NICOLO. I do not deny that his excellency is most

learned and most competent. But I affirm that he would not know how to solve these seven problems which he sent for me to work out by the general rule. Because if his excellency does not know how to solve that of the cosa and cube equal to the number (which you have besought of me with so much entreaty), how could he know how to solve the greater part of these, which conduct to operations of a much stranger kind than that of the cosa and cube equal to the number; so that if he knew how to solve all these problems, much more easily would he know how to solve that of the cosa and cube equal to the number, and if he knew it I am sure that he would not go begging and seeking for it.

ZUAN ANTONIO. I know not how to answer you, because I do not understand these things, but whenever you speak with him I believe that he himself will know what to reply. However, let all those matters pass, and that I may not have lost my pains in coming, give me at any rate the simple copy of the thirty cases that were proposed to you by the said Master Antonio Maria Fior, and if you can also give me a copy of the thirty questions that were asked by you of him you will do me the greatest favour.

NICOLO. Of his (though I can ill spare time) I will make you a copy, but mine I cannot let you have, because I have no copy at hand, and I cannot exactly re-

member what they all were, because they were all dissimilar; but if you go to the notary, he will no doubt be able to give you a copy.

ZUAN ANTONIO. Be pleased, then, to give me his.

NICOLO. They are these precisely as he wrote them:—

'Glory to God, 1534, the 22nd day of February, in Venice.

'These are the thirty arguments proposed by me, Antonio Maria Fior, to you, Master Nicolo Tartaglia.'"

It is not requisite to quote them here. From this account given, by Tartalea himself, it appears that Jerome's application was of a reasonable kind. Tartalea had been during four years in possession of his knowledge, and had published nothing but his small work on Artillery, that too, though he was a poor man, at his own expense. There was no reason to believe that Tartalea designed to publish what he knew in any independent work on mathematics. Moreover, there seems to have been no publisher willing to print at his own cost the writings of a man who could not address the learned in the language properly appointed for their use, or could not write even Italian otherwise than in the very dialect to which he had been born. It was therefore just and natural that Cardan should propose the embodiment in his own treatise of Tartalea's additions to the science about which he wrote, with a due publication of his claims as a discoverer. If,

however, Nicolo desired to keep his knowledge to himself, then it was necessary for the advance of his favourite science that Cardan should acquire it in some other way. Something he had already discovered, and he hoped from any calculations that he might persuade Tartalea to furnish that he could obtain hints by which he would be assisted in discovering the whole of the secret kept with too much jealousy from the science to which it belonged. Tartalea repelled every advance of this kind, so unceremoniously, that Jerome, who was hot in disputation, fell into a rage, and wrote a very angry letter, which Tartalea has printed, and which I append in full. It was of course not written for print, and is an example of the kind of impatient violence which Cardan used in private arguments, but always abstained from carrying into his books. Had not Tartalea published the whole quarrel, very little trace would have been left of it, for Jerome put no wrath or malice into works deliberately written for posterity. I desire also, for a reason that will afterwards appear, to call attention to the manner in which mention is made of the Marquis del Guasto in the dialogue just quoted, and in the succeeding letter.

Letter from Cardan to Nicolo Tartalea, dated the 12th of February, 1539[1].

" I wonder much, dear Messer Nicolo, at the unhand-

[1] Tartalea. Quesiti et Inventiori Diverse. Lib. ix. p. 117. In translating these letters I provide them with more stops than I find in the original. Tartalea wrote his book in the Venetian dialect, to which he was accustomed—a kind of Italian most familiar to English readers, as it is to be seen moderately caricatured in some of Goldoni's plays, as, for example, in the Poeta Fanatico. Moreover, Tartalea corrected the press badly, and allowed sentences to be printed one into another in a very reckless way. I quote in illustration the first sentence of this letter by Cardan, as printed by Nicolo Tartalea: " Mi marauiglio molto Messer Nicolo caro de si disconueneuole risposta haueti data à uno Zuan Antonio da Bassano libraro el quale da mia parte ui ha pregato li uolesti dare la risposta di sette, ouer otto questioni le quale ui mandai, e la coppia delle proposte fatte tra uoi e Maestro Antonio Maria Fior con le sue solutioni alle quale non ui e bastato di non mandarmene niuna saluo che quelle de Maestro Antonio Maria le quale sono 30 proposte ma re uera quasi una sola sostantia, cioe cubbo è cosa equal à numero, pero mi doglio tra l'altre disgratie di questa arte che quello li danno opera sono tanto discortesi è tanto presumeno di se stesso, che non senza cagion sono indicati dal uulgo apresso che pazzi à cio ui cani fora de questa fantasia della quale causi nouamente messer Zuanne da Coi, cioe d'essere il primo homo del mondo donde se partito da Millano per disperato, ne uoglio scrivere amoreuolmente e trarui fori di fantasia che uoi ui crediati essere si grande ui faro conoscere con amoreuole admonitioni per le uostre parole medesime che seti piu apresso a la ualle che alla sumita del monte, potria ben essere che in altra cosa fosti piu esercitato, e ualente che non dimostrati per la rispesta e prima ui auiso pero che ui ho hauuto in bon conto e subito ariuo li uostri libri sopra le artegliarie ne comprai doi che solo porto Zuan Antonio delli quali uno ne dette al Signor Marchese, e l'altro tene per mi et oltra cio ui laudai molto al Signor Marchese pensando fosti piu gentil reconoscitore, e piu humano e piu cortese, e piu sufficiente de Messer Zuanne qual uoi allegati, ma mi pare poca differentia da luna à laltro se altro non mostrati hora peruenire à fatti ne accuso in quatro cose de momento." That is a tolerable scolding for a man to utter in a single breath. Tartalea was evidently determined to allow no point to remain in Cardan's abuse of him.

some reply you have made to one Zuan Antonio da Bassano, bookseller, who on my part prayed that you would give him answers to the six or eight questions that I sent you, and the copy of the propositions exchanged between you and Master Antonio Maria Fior, with their solutions, to which it was not enough for you to return nothing but the questions of Master Antonio Maria, which are thirty in number but one only in substance, that is to say, treating of cube and cosa equal to the number, but it grieves me much that among other discomforts of this science those who engage in it are so discourteous, and presume so much on their own worth, that it is not without reasons they are called fools by the surrounding vulgar. I would pluck you out of this conceit, as I plucked out lately Messer Zuanne da Coi, that is to say, the conceit of being the first man in the world, wherefore he left Milan in despair; I would write to you lovingly" [he writes in a rage] "and drag you out of the conceit of thinking that you are so great—would cause you to understand from kindly admonition, out of your own words, that you are nearer to the valley than the mountain-top. In other things you may be more skilled and clever than you have shown yourself to be in your reply; and so I must in the first place state that I have held you in good esteem, and as soon as your book upon Artillery appeared, I bought two copies, the only ones that Zuan Antonio brought, of which I gave one to

Signor the Marquis, thinking you capable of more courteous recognition, more refined, more gentlemanly, and more competent than Messer Zuanne as you allege yourself to be, but I see little difference between one and the other; if there be any you have not shown it. Now to come to facts, I accuse you upon four important points.

The first is, that you said my questions were not mine, but belonged to Messer Zuanne Colle; as if you would have it that there is no man in Milan able to put such questions. My master, clever men are not discovered by their questions, as you think, but by their answers; therefore you have been guilty of very grave presumption. There are many in Milan who know them; and I knew them before Messer Zuanne knew how to count ten, if he be as young as he would make himself.

The second is, that you told the bookseller that if one of the questions of Master Antonio Maria could be solved, all mine would be solved. I ask you, for mercy's sake, with whom you think that you are speaking? With your pupils, or with men? Where did you ever find that the discovery of the root pronica media[1], which lies at the bottom of the solution of all the thirty questions of Master Antonio Maria, which is founded on the

[1] "Dove trovasti noi mai che la inventione de la radice pronica media, la quale è il fondamento de . . . . posse essere la resolutione d'una questione di cubo è numero equal a censo."

eighth problem of the sixth book of Euclid, could resolve a question of cube and number equal to the census, under which section is to be ranked the proposition which says, 'Find me four quantities, in continuous proportion, of which the second shall be two, and the first and fourth shall make ten.' I speak in the same way of the others, so that while you wished to show yourself a miracle of science to a bookseller, you have shown yourself a great ignoramus to those who understand such matters; not that I myself esteem you ignorant, but too presumptuous; as was Messer Zuanne da Coi, who thinking to get credit for knowing what he did not know, lost credit for knowing what he did.

The third point is, that you told the said bookseller that if one of my questions were solved all would be solved, which is most false, and it is a covert insult to say that while thinking to send you six questions, I had sent but one, which would argue in me a great confusion of understanding; and certainly, if I were cunning, I would wager a hundred scudi upon that matter; that is to say, that they could not be reduced either into one, or into two, or into three questions. And, indeed, if you will bet them, I will not refuse you, and will come at an appointed time to Venice, and will give bank security here if you will come here, or will give it to you there in Venice if I go thither. This is not mere profession,

for you have to do with people who will keep their word.

The fourth is a too manifest error in your book entitled the 'New Science' of Artillery, in which you will have it, at the fifth proposition of the first book, that no body of uniform weight can traverse any space of time or place by natural and violent motion mixed together; which is most false, and contrary to all reason and natural experience. The argument with which you prove it is still more extraordinary than the answer you gave to the bookseller. Do you not know that it is unsuitable? In its descent a body moves with increased velocity, and in forward progress it moves with diminishing speed, as we see in the throwing of a stone, which, as it descends, comes faster and faster to the earth, but when it left the hand went more and more slowly, from which you may draw other strange arguments in the said book, if you have it in mind that men of sense are not to be contradicted lightly. I shall be held excused, I hope, for contradicting you, because, in treating of artillery, which was little in your vocation, you exerted yourself to say something notable, and you must not, for my rudeness, think that I am like yourself and Messer Zuan Colle.

I send you two questions with their solutions, but the solutions shall be separate from the questions, and the messenger will take them with him; and if you cannot solve the questions he will place the solutions in your

hand. You shall have them each to each, that you may not suppose I have sent rather to get than to give them; but return first your own, that you may not lead me to believe that you have solved the questions, when you have not.

In addition to this, be pleased to send me the propositions offered by you to Master Antonio Maria Fior, and if you will not send me the solutions, keep them by you, they are not so very precious. And if it should please you, in receiving the solutions of my said questions—should you be yourself unable to solve them, after you have satisfied yourself that my first six questions are different in kind—to send me the solution of any one of them, rather for friendship's sake, and for a test of your great skill, than for any other purpose, you will do me a very singular pleasure.

The first question: Make me of ten four quantities in continued proportion whose squares added shall make sixty. A like question is put by Brother Luca, but he does not answer it.

The second: Two persons were in company, and possessed I know not how many ducats. They gained the cube of the tenth part of their capital, and if they had gained three less than they did gain, they would have gained an amount equal to their capital. How many ducats had they?

HIERONIMO CARDANO, Physician."

To this letter Tartalea replied categorically on the 18th of February, 1539[1], at such very great length, that I must be content to quote only the few passages which bear immediately on our present subject. It must be quite obvious that the mention made in the preceding letter of Alphonso d'Avalos, Marquis del Guasto, was altogether natural. Cardan knew when the tract on artillery came out, that Tartalea possessed a bit of mathematical knowledge which he himself was desiring greatly to acquire. If only in the hope of finding some clue to his secret, it was natural that he should have bought anything mathematical written by Nicolo, and as the subject was the management of artillery, it would occur to him most readily to present a copy to his patron, who, possessing the tastes of a scholar, was appointed general in the district, and was concerned very actively in the prevailing wars. That Jerome had not only bought the tract but read it carefully, is evident from the perfectly just criticism of one of its propositions contained in the preceding letter. The first point of accusation in that letter consisted, I need scarcely say, of a prevarication. I have pointed out the vicious clause in the ethics sanctioned by his Church, and almost universal in his time, which allowed truth of mind to be put out of sight for any useful purpose, if the truth of the lip only was preserved. Cardan was preserved

[1] Op. cit. pp. 118—122. The pages are numbered in pairs.

rather by his ruggedness than by his virtue from any frequent exercise of this dishonest right of circumvention. In his reply to Tartalea concerning Zuanne da Coi, and his questions, he wrote, however, with a manifest intention to deceive. He said only that he had long known of such problems, he meant it to be understood, that he had long known how to solve them. Tartalea, however, knew his ground, and walked into no pitfall:—"Concerning your first accusation," he wrote to the "Most Excellent Messer Hieronimo," "I answer and say, that it is time that I said that such questions came from Messer Zuanne da Coi, because a year and a half ago he proposed to me one like the last but one (only in other words), of which I made him himself confess here in Venice that he did not understand it, and that he did not know the answer, so that for such reason, and from other indications, I judged those questions to be his, and that he had himself sent them to me under your name. But when that bookseller assured me that he had them of your excellency, I judged that the said Messer Zuanne da Coi had been to Milan, and that they were there proposed to you by him (as I still judge, and believe firmly), and that you, being unable to solve them, sent them to me to be solved, for reasons that will presently be mentioned[1]."

[1] "Ma quando chel libraro me acerto hauerle hauute da uostra eccellentia giudicai che il detto Messer Zuanne da Coi fusse uenuto à

Cardan, I think, had worked his way by that time somewhat further than Tartalea supposed; the gist of Tartalea's argument upon the matter was, however, true, and when writing the above passage he had certainly the best of the discussion. He answered well and boldly. He showed equal courage, when, having explained that Cardan's challenge was founded on a misunderstanding of his answer to the bookseller, he picked up the gage that had been thrown before him. Jerome's complaint was superfluous, he said: "But inasmuch as I may consider that your excellency very much desires to try your skill with me, which being so, if I were sure to be a loser, I would not refuse such a challenge,—that is to say, to bet upon this matter the said hundred ducats,—and I will come personally for the purpose to Milan, if you will not come to Venice."

Tartalea will be much perplexed to find a hundred ducats should he lose the wager, and I know that Jerome sent out his defiance from a home into which ducats did not come even by scores. Each combatant can afford only to win, but gamblers are not always wise, and men could then gamble not less readily in algebra than over cards or dice.

Tartalea met more boldly than wisely the objection

Millano et che li hauesse proposte à quella (come che anchor giudico et tengo per fermo) et che quella per non saperle risoluere me le habbia mandate da risoluere à me per le ragioni che di sotto se dirà."

made by Cardan to the fifth proposition of his science of artillery, which proposition, in modern language, amounted to the assertion that a body could not move at once under the influence of a transmitted force and the force of gravitation. Jerome knowing of course nothing of the theory of gravitation, saw the facts, and urged them very properly. Nicolo, like a good disputant, replied: "I answer and say that the reasons and arguments adduced by you for the destruction of my said fifth proposition, are so weak and ill-conditioned, that an infirm woman would be strong enough to beat them to the ground." He then endeavoured in a technical way to reduce Cardan's suggestion to an absurdity, and summed up by addressing to Jerome the retaliatory comment, that "You thinking to make yourself appear a miracle to me with your ridiculous oppositions, have proved yourself, I will not say a great ignoramus, as you said to me, but a man of little judgment."

In reply to the unphilosophical sneer against the study of artillery, Tartalea spoke very worthily, in the following passage, which contains also the next reference to the Marquis d'Avalos, whose precise relation to the matter in dispute ought to be understood distinctly. Of the artillery: "As to that particular, I answer and say, that I take pleasure in new inventions, and in treating and speaking of things about which other men have not

treated or spoken, and I take no pleasure in doing as some do, who fill their volumes with things robbed from this or that other author. And although the speaking of artillery, and of the firing of it, is not a thing very honourable in itself, yet, since it is a new matter, and not barren of speculation, I thought well to say a little on it[1], and in connexion with that subject, I am at present bringing out two sorts of instruments belonging to the art, that is to say, a square to regulate the discharging of the said artillery, and also to level and examine every elevation. Also, another instrument for the investigation of distances on a plane surface, the description of which instruments will be published with my said work on artillery. And because you have written to me that you purchased two of my said books, one of which you gave to his excellency the lord marquis, and the other you kept for yourself, I have thought good to send you four copies of the said instruments, and have given them to the house of Messer Ottaviano Scoto, who will see that they are sent to you by some messenger, to be added to those volumes;

[1] This passage, so creditable to Tartalea in its sense and temper, stands in his own words thus: "Circà a questa particolarita ve rispondo et dico, che me diletto, de noue inuentioni et di trattare, et parlare de cose che altri non habbia trattato, ne parlato, et no me diletto di far come fanno alcuni, chi impiono li suoi uolumi di cose robate da questo et da quello altro autore. Et quantunque à parlare delle artegliarie, et lor tiri non sia cosa molto honoreuole in se, pur per esser una materia noua, et di non puoca speculatione me apparso di parlarne alquanto. . . ." Op. cit. p. 119.

of which four instruments you will give two to his excellency the lord marquis, and the other two keep as your own."

It was practically an important gain to Tartalea, if he could suggest, through any friend who would get for them proper attention, a knowledge of his inventions to a military chief able if he chose to bring them into use and notice. The complaints made by Tartalea have led to the supposition that Cardan made artful use of the name and influence of his patron, in a deep design for the wresting from Nicolo of the small bit of knowledge he desired to get[1]. The supposition is quite incorrect.

[1] In Hutton's Mathematical Dictionary the spirit of the next letters between Cardan and Tartalea is expressed in the following manner, and it is the usual version of the story: "Finding he could not thus prevail with all his fair promises, Cardan then fell upon another scheme. There was a certain Marquis dal Vasto, a great patron of Cardan, and, it was said, of learned men in general. Cardan conceived the idea of making use of the influence of this nobleman to draw Tartalea to Milan, hoping that then, by personal entreaties, he should succeed in drawing the long-concealed rules from him. Accordingly, he wrote a second letter to Tartalea, much in the same strain with the former, strongly inviting him to come and spend a few days in his house at Milan, and representing that, having often commended him in the highest terms to the marquis, this nobleman desired much to see him; for which reason Cardan advised him, as a friend, to come and visit them at Milan, as it might be greatly to his interest, the marquis being very liberal and bountiful; and he besides gave Tartalea to understand, that it might be dangerous to offend such a man by refusing to come, who might, in that case, take offence, and do him some injury. This manœuvre had the desired effect. . . . ." Hutton's Philosophical and Mathematical Dictionary (ed. 1815), vol. i. p. 81. So the tale is generally told against Cardan. From his entire letter which follows, and the rest of the story as narrated in the text, the reader may judge how far this version is a fair one.

On Tartalea's own showing, nothing could be more natural and gradual than the succession of steps by which the marquis rose into importance during the correspondence between the two mathematicians. I very much doubt, also, whether we ought not to attribute the tone of Jerome's next answer to Tartalea, not only to a prudent desire to maintain friendly negotiations, but in an equal degree to the fact that his anger, always shortlived, being at an end, he desired to heal the wounds that he had made, and behave with the courtesy due from one scholar to another. The reply, dated the 19th of March, 1539, now follows[1]:

"My very dear Messer Nicolo, I have received a very long letter of yours, and the longer it was the more it pleased me; I could have wished it doubled, if only you would not think that my biting words proceeded either from hate, for which there was no cause, or from malignity of nature, since I do good, when I can, much more readily than harm: it is my business to heal: let me do that; not bitten with envy at the question whether you are my equal or my inferior; I should have no cause to be so if you were my master in this art; I should struggle to soar with you, not speak you ill. Besides, the envious malign in absence not in presence; but I wrote that abuse

[1] Quesiti et Inventioni (ed. cit.), Lib. ix. p. 122. The letter begins, "Messer Nicolo mio carissimo."

to stir you up to write again, judging, with out-of-the-way craft, what sort of a man you were from the relation of Messer Zuan Colle, who has been here. I liked him much, and did my best to give him pleasure, so that from his account I learned to think well of you, and even designed to send to you a letter; but he behaved ungratefully, speaking ill of me privately and publicly, and inviting me improperly with placards and writings, which things not succeeding to his own content (he had to one question three answers—one from Euclid, the other from Ptolemy, the other from Geber), he became so confounded that he left in despair, quitting a school of about sixty pupils, for which I was sorry enough. So that if I wrote sharply to you I did it willingly, thinking to cause that to follow which has followed; that is to say, to have your answer, together with the friendship of a man so singularly able in his art as I judge you to be by the things written in your letter. Thus I have committed an offence of which I am not willing to repent.

Now you must know, that in addition to your letter, I received a placard of the things which you are now about to read publicly in San Zuanne Polo, which bill has given me the highest pleasure; and besides that, you promised me four instruments, two to give to the lord marquis and two for me: and Signor Ottaviano writes to me that he sends four, though I have yet received neither

two nor four; but he says that they shall come with certain books that he is sending. I should have been glad to have them to give to the lord marquis; when I have them I will give them to him.

As for the answers to my four accusations, I need only reply to two; one concerns the attack on your fifth proposition in the Arte Nova, the other is about coming to a trial against you, who are the more able man in your own art. With regard to that second point, I would much rather live something of a poltroon than die a hero, the rather, as you concede my position by saying that Zuan Antonio had misunderstood, which puts an end to the occasion of our combat. I hope that you will come to Milan and learn to know me without the deposit of a hundred ducats, because in truth, I know you to be a very able man, and knowing one another we might both be able to deliberate together.

As for the disputation on the subject of your fifth proposition, certainly, you do well to use bold words, and defend the opinion you have published. And certainly when you come (as I hope, please God, you will) to Milan, we will talk of it more at our ease, and the rather, as I had your letters only yesterday evening" [which implied that a month passed before they could be transmitted from Tartalea in Venice, to Cardan in Milan], " and to-day I am obliged to write to you by command of the lord marquis,

so that I have not had time to reflect upon your other propositions.

I pray you, at any rate, to send or bring me what remains of your thirty deductions which you gave to Master Antonio Maria. If you will also send me some solutions of your two rules, or will give them to me when you come, I shall be in the highest degree obliged; for you must know that I take pleasure in all courtesy, and that I have sent to press a work entirely on the practice of Geometry, Arithmetic, and Algebra, of which up to this date more than the half is printed, and if you will give them to me so that I may publish them in your name, I will publish them at the end of the work as I have done with all others who have given to me anything of value, and will there put you down as the discoverer, and if you wish me to preserve your secret, I will do as you desire.

I told the lord marquis[1] of the instruments you had

[1] "Io avisai la eccellentia del Signor Marchese de gli istromenti quali gli mandati (anchor che non siano per fina hora gionti) et li dissi del cartello, e sua eccellentia mi commando lo legesse e tutte queste uostre cose piacque grandamente à sua eccellentia. Et mi commando di subito ui scrivesse la presente con grande istantia in nome suo, auisandoui che uista la presente douesti uenir à Millano senza fallo che uoria parlar con uoi. Et cosi ue esorto à douere venire subito, et non pensarui su, perche ill detto Signor Marchese è si gentil remuneratore delli uirtuosi, si liberale, et si magnanimo che niuna persona chi serue sua excellentia mentre sia da qualche cosa resta discontenta. Si che non restati de uenire e venereti à logiare in casa mia non altro Christo da mal ui guardi alli. 13. di Marzo, 1539. Hieronimo Cardano, medico." To which Tartalea subscribes: "Per costui son ridutto à

given him—they are not yet come to hand—and told him of the placard, and his excellency commanded me to read it; and all your things pleased his excellency greatly. And he commanded me at once to write the present letter to you with great urgency in his name, to advise you that on receipt of the same you should come to Milan without fail, for he desires to speak with you. And so I exhort you that you should come at once, and not deliberate about it, because the said marquis is a courteous remunerator of men of genius, so liberal and so magnanimous, that no person who does a service to his excellency, no matter in what respect, is left dissatisfied. So do not delay to come, and come to lodge in my house. So no more. Christ keep you from harm. Written on the 13th of March, 1539.

HIERONIMO CARDANO, Physician."

That the desire of the marquis to see Tartalea was genuine I see no reason to doubt. That Jerome was glad to have a chance of talking to his jealous correspondent, and persuading him, if possible, by word of mouth, is, of course, equally certain. The brief comment appended by Tartalea to the preceding letter is not good-humoured.

"NICOLO. I am reduced by this fellow to a strange

un stranio passo, perche se non uado à Millano il Signor Marchese il potria hauer per male, et qualche male me ne potria reuaire, et mal uolontiera ui uado, pur ui uoglio andare." Op. cit. pp. 123, 124.

pass, because if I do not go to Milan the lord marquis may take offence, and such offence might do me mischief, I go thither unwillingly; however, I will go.". The suggestion that there was any danger in not going sprung entirely, it should be noticed, from Tartalea himself. Cardan had only urged, that as D'Avalos was a free-handed patron—a point upon which all chroniclers who speak of him agree—Nicolo should not fear that he would be a loser by the journey.

Accordingly, Tartalea went to Milan, and happening to arrive at a time when D'Avalos was absent, stayed for three days in Cardan's house as his guest. The result of the visit Nicolo represented to himself in his common-place-book by the succeeding dialogue[1]:

"*Result of personal intercourse with his Excellency the said Messer Hieronimo Cardano, at his house in Milan, the 25th of March*, 1539.

Messer Hieronimo. I am very pleased that you have come just at this time when his excellency has ridden to Vigevano, because we shall have leisure to enjoy ourselves and talk together over our affairs till he returns. Certainly you were somewhat too discourteous in resolving not to give me the rule you discovered upon

[1] Op. cit. p. 123.

the subject of the cosa and cube equal to the number, especially when I had so much entreated for it."

To this the reply of Tartalea was not unreasonable, and it may be well to say beforehand that it is to be read as in every main point true. He not only was at that time translating Euclid, but he was also reserving himself for a work of his own on arithmetic, geometry, and algebra, which he in the end did publish at Venice, seventeen years afterwards—that is to say, just before his death. It extended even then no further than quadratic equations, being his Book the First of Algebra, and did not contain the whole of his knowledge, nor does his knowledge of the two contested rules appear to have fructified at all in his own mind during all that time, as he justly supposed that it might, and as it began to do the moment it had found its way into the richer soil of Cardan's genius. Nicolo replied thus:

"NICOLO. I tell you that I am not so very chary on account of the simple rule or the calculation made by use of it, but on account of those things that by knowledge of it may be discovered, because it is a key that opens the way to the investigation of an infinity of other rules, and if I were not at present occupied upon a translation of Euclid into the vulgar tongue (and by this time I have translated as far as his thirteenth book), I should have already found a general rule for many other cases. As

soon as I shall have finished my labour upon Euclid already commenced, I am intending to compose a work on the practice of arithmetic, and together with it a new algebra, in which I propose not only to publish to every man all my said discoveries concerning new cases, but many others, to which I hope to attain, and I hope to show the rule for investigating an infinity of other things, which I hope will be a good and useful work. That is the reason why I deny my rules to everybody, though I at present make no use of them (being, as I said, occupied on Euclid), and if I taught them to any speculative person like your excellency, he could easily from such evidence find other cases to join to the discovered ones, and publish with them as himself their discoverer, by doing which he would spoil all my design. So that this is the chief reason why I have been so discourteous towards your excellency, and the rather, as you are now printing your work on the same subjects, and have written to me that you propose to publish such my inventions under my name, and to make me known as the discoverer. Which, in fact, does not at all please me, because I wish to publish such my discoveries in my own works and not in the works of other people.

M. HIERONIMO. And I also wrote to you that if you were not content that I should publish them, I would keep them secret.

NICOLO. Enough that on that head I was not willing to believe you.

M. HIERONIMO. I swear to you by the sacred Gospel, and on the faith of a gentleman, not only never to publish your discoveries, if you will tell them to me, but also I promise and pledge my faith as a true Christian to put them down in cipher, so that after my death nobody shall be able to understand them. If you will believe me, do; if not, let us have done[1].

NICOLO. If I could not put faith in so many oaths I should certainly deserve to be regarded as a man with no faith in him; but since I have made up my mind now to ride to Vigevano to find his excellency the lord marquis, because I have been here already three days, and am tired of awaiting him so long, when I am returned I promise to show you the whole.

M. HIERONIMO. Since you have made up your mind at any rate to ride at once to Vigevano to the lord marquis, I will give you a letter to take to his excellency, in order that he may know who you are; but before you go

[1] "M. HIERO. Io ui giuro, ad sacra dei evangelia, e da real gentil'huomo, non solamente da non publicar giamai tale uostre inventioni, se me le insignate. Ma anchora ui prometto, et impegno la fede mia da real Christiano, da notarmele in zifera, accioche dapoi la mia morte alcuno non le possa intendere, se mel uoleti mo credere credetilo se non lassatilo stare. NICOLO. Non uolendo io prestar fede à tanti uostri giuramenti io meritaria certamente da esser giudicato huomo senza fede, ma perche ho deliberato caualcare per fina à Vegevene . . . ." &c. Op. cit. p. 194.

I should wish you to show me the rule for those cases of yours, as you have promised.

NICOLO. I am willing; but you should know, that in order to be able on any sudden occasion to remember my method of operation, I have reduced it to a rule in rhyme, because, if I had not used this precaution, it would often have escaped from my mind; and although these rhymes of mine are not very neat, I have not minded that, because it was enough that they served to bring the rule into my memory whenever I repeated them. That rule I will write for you with my own hand, in order that you may be sure that my discovery is given to you fairly and well."

The verses then follow which contain the rule for the three case, $x^3 + bx = c$; $x^3 = bx + c$ and $x^3 + c = bx$, discovered by Tartalea in 1534. Translated into the language of modern mathematics, they read thus[1]:

[1] The mystic rhymes themselves here follow. Tartalea's effusion was a thing to puzzle Petrarch:

"Quando chel cubo con le cose apresso
Se agualia à qualche numero discreto
Trouan dui altri differenti in esso
Dapoi terrai questo per consueto
Ch'el lor produtto sempre sia eguale
Al terzo cubo delle cose neto
El residuo poi suo generale
Delli lor lati cubi ben sottratti
Varra la tua cosa principale.
In el secondo de cotesti atti
Quando chel cubo restasse lui solo

Find two numbers z and y, so that $z - y = c$ in the first case or $z + y = c$ in the second and third cases, and $zy = (\frac{1}{3}b)^3$; then $x = \sqrt[3]{z} - \sqrt[3]{y}$ in the first case, and $x = \sqrt[3]{z} + \sqrt[3]{y}$ in the other two. The original verses are given in a note below. Tartalea was not by any means singular in his practice of converting such a rule into a versified enigma. In this respect he followed the example set by the first of the Italian printed algebrists, Luca di Borgo, who had for each of the three forms of which an equation of the second degree is susceptible, a particular rule, instead of one general rule that sufficed for all. The three rules he expressed in three Latin quatrains, of which one will be found cited below as a specimen of the manner[1]. It was not, therefore, any individual con-

Tu osseruarai quest 'altri contratti
Del numer farai due tal part' a uolo
Che luna in l'altra si produca schietto
El terzo cubo delle cose in stolo
Delle qual poi, per commun precetto
Torrai li lati cubi insieme gionti
Et cotal summa sara il tuo concetto
El terzo poi de questi nostri conti
Se solue col secondo se ben guardi
Che per natura son quasi congionti
Questi trouai, et non con passi tardi
Nel mille cinquecent'e quatro è trenta
Con fondamenti ben sald' e gagliardi
Nella citta dal mar' intorno centa."

Quesiti et Inventioni, p 123

I have not ventured to interfere with the allowance originally made by Tartalea to his poem, of one full stop and two commas.

[1] Primi canonis versus.

" Si res et census numero coequantur a rebus

ceit which caused Tartalea to put his process into rhyme.

" Which rhyme," having quoted it, he went on to say, " speaks so clearly, that, without other example, I think your excellency will be able to understand the whole.

M. HIERONIMO. I shall no doubt understand it, and have almost understood it at once; go however, and when you have returned, I will let you see whether I have understood.

NICOLO. Now your excellency will remember not to fail of your promised faith, because if by ill fate you should fail in it, that is to say, if you were to publish these cases either in that work which you are now printing, or in any other, though you published it under my name, and gave it as my own discovery, I promise and swear that I will cause a book to be printed immediately afterwards that you shall not find very agreeable.

M. HIERONIMO. Do not doubt that I shall perform what I have promised; go, and feel secure upon that point; give this letter of mine to the lord marquis on my part.

NICOLO. Now I bid you farewell.

Dimidio sumpto censum producere debes
Addere que numero: cujus a radice totiens
Tolle semis rerum census latusque redibit."
Luca di Borgo. *Summa de Arithmetica Geometria*, &c. (ed. 1494) Dist. viii. Tract 5, p. 145.

M. HIERONIMO. May the hour be lucky in which you depart.

NICOLO (*aside*). By my faith, I shall not go gallanting to Vigevano. So I shall just travel back to Venice, come of it what may[1]."

[1] "NICOLO. Hor su me aricomando. M. HIERO. Andati in bon' hora.

NICOLO. Per la fede mia che non uoglio andare altramente à Vigevena, anci me uoglio uoltare alla uolta de Venetia, uada la cosa come si uoglio." Ques. et Inv. p. 124.

CHAPTER XIII.

THE REST OF THE DISPUTE BETWEEN THE TWO MATHEMATICIANS—IN THIS CHAPTER IS CONTAINED AN ACCOUNT OF THE LIFE AND FORTUNES OF LODOVICO FERRARI, CARDAN'S FOREMOST PUPIL.

NICOLO went off by no means easy in his mind. The secret was no longer his own, and Cardan was a busy-headed fellow. Jerome at once went to work upon Tartalea's rules, but being misled by the badness of the verses, into the reading of $(\frac{1}{3}b)^3$ as $\frac{1}{3}b^3$, he could not work with them; he therefore wrote the following note to Venice on the 9th of April[1].

"My very dear Messer Nicolo,—I am much surprised at your having left so suddenly, without speaking to the lord marquis, who came on Easter Sunday, and could not have your instruments until the Tuesday afterwards.

[1] Ques. et Inv. p. 124. The letter begins, "Messer Nicolo mio carissimo." All these letters end, it may be observed, with "Non altro," the "So no more," not yet extinct among our humble letter-writers. It is followed as regularly by the phrase "God" [or Christ] "keep you from harm," "Iddio da mal ui guardi." Thus the ending of this letter, for example, was "Non altro Christo da mal ui guardi. In Millano alli 9 Aprile 1539. Hieronimo Cardano medico, tutto vostro."

and with great difficulty. However, he had them, and understood them; I presented them on the same Tuesday in the evening. Truly I think you were wrong in not making yourself known to his excellency, because he is a most liberal prince, and a great lover and abettor of genius, and he valued your instruments and desired to have them explained to him, and I showed him succinctly their value; now that must suffice; the time may yet come when you may be glad to be known by the lord marquis. When I know for what reason you left, or by whom you were advised to do so, I will tell him.

As for my work, I think it will be complete next week, for there are only three more leaves to be filled. As for the question of your case of the cosa and cube equal to the number, I thank you much for having given me the rule, and I will let you see that I shall not be ungrateful. But, however, I must confess my fault in not having had ingenuity enough yet to understand it, therefore I beg you, for the love you bear me, and for the friendship that is between us, and that will, I hope, last while we live, to send me solved this question—one cube, three cosas equal to ten; and I hope that you will have as much good-will in sending as I in receiving it. So no more. Christ keep you from harm. In Milan, on the 9th of April, 1539.

HIERONIMO CARDAN, Physician.

"All" [we should say ever] "yours."

Nicolo in reply did not return Jerome's "Mio Carissimo," or sign himself all his, but explained to the "Honorando Messer Hieronimo," that nobody must be blamed for advising him to return to Venice, because he had promised his friends that he would be with them at Easter, and as it was he had much trouble in getting home by Holy Sunday. "Concerning your work," he said, "I much desire that it shall be out soon, and should like to see it, because if I do not see it I shall be suspecting that you have broken your word, that is to say, may have interpolated my rules in some part of it[1]." Certainly if Nicolo had had blood-guiltiness upon his conscience, and had betrayed his secret to a woman, he could not have been more nervously expectant of the terrors of exposure. Seeing at once what part of his rhyme had puzzled Cardan, he gave the required explanation, and concluded his letter thus: "So no more. God keep you from harm. In Venice, on the 23rd of April, 1539. Remember your promise.

NICOLO TARTALEA, of Brescia."

On the 12th of May Jerome set his friend's mind at ease by sending a copy of his book, with the following letter:

[1] "Circa alla vostra opera molto desidero che la se fornisca presto, et ui nederla, perche per fin che non la uedo sto suspettoso che quella non mi manchi di fede, cioe che quella non ue interponga, li miei capitoli." Tartalea, p. 124.

"In answer to your letter of the 23rd of April, received the other day, very dear Misser Nicolo, I will reply to you succinctly part by part, and first as to the excuse of your departure without going to Vigevano. I desire nothing but what you desire, and regret that you have been put to so much trouble on my account, without any advantage for yourself.

"As to my work, just finished, to remove your suspicion I send you a copy, but I send it unbound, for I would not have it beaten while it was so fresh. As for your rule and my case solved by you, I thank you very particularly, and praise your ingenuity above all with which I have met, and am more pleased than if you had given me a hundred ducats. I hold you as my very dear friend. I have tried the rule and found it universal. As to the doubt you have lest I should print such your inventions, my faith that I have given you with an oath, ought to suffice[1], because the hastening of my book was nothing to the purpose, for whenever I like I can add to it. But I hold you excused by the importance of the

[1] "... la mia fede che ui ho data con giuramento, ui doueua bastare, perche la speditione del mio libro non facena niente a questo, perche sempre che mi pare gli posso sempre aggiongere, ma ne ho per escuso che la dignita della cosa, non ui lassa fondare sopra quello che ui doueti fondare, cioe sopra la fede d'un gentil'huomo e ui fondati sopra una cosa che non val niente, cioe ..... ma el ponto è qua chel non è mazor tradimento che à esser mancator di fede, e far dispiacere à chi l'ha fatto appiacere." ..... Op. cit. p. 125.

matter for not resting content with that which ought to content you, that is to say the word of a gentleman, and depending on a thing that is of no worth at all, that is to say the finishing of a book to which a capitulum novum or capitula nova could at any time be added, and there are a thousand other ways, but the point is that there is no greater treachery than to break faith and to displease those who have given us pleasure, and if you were to try me you would find whether I shall be your friend or not, and whether I shall be grateful for your friendship and the favours you have done me.

"I send word to you also, and earnestly beg concerning these my printed works for my love of him who has printed them, and will send some into your town for sale, that you will not lend them about more than necessary, for my sake. If they had been printed at my own expense I would not say a word, because I care more for the profit of my friends than for my own. So no more. God keep you from evil. In Milan, the 12th of May, 1539.

"HIERONIMUS CARDANUS *medicus, totus vester.*"

Nicolo, partly appeased, or glad of something new to grumble at, replied on this occasion to the "Honorandissimo Messer Nicolo," and signed himself "Nicolo Tartalea of Brescia, all yours." He had received the book,

but being busy over his Euclid, had only found time to glance at it and fall at once upon a shocking error, "so gross," he says, "that I am amazed at it, for one would have thought that it might have been seen with only half an eye[1]." He is quite "sorry for the honour" of his friend. Nicolo had verily the temper of a thistle.

On the 10th of July in the same year the restless mathematician was further excited by a letter from an old pupil settled at Bergamo, one Master Maphio, asking help in the untying of some knot of a problem, and ending with a scrap of gossip, to the effect that a friend from Milan had written word to him that the physician Cardan was engaged over a new algebraical work, treating of certain new discoveries. Could they be Tartalea's? Certainly they were, Tartalea replied, if the news were true, and cited the grim proverb: "If you wish your counsel kept, make confidant of nobody." He begged Maphio to be on the alert, and send him if he could more tidings on the matter. The rumour, I need not say, was false. Jerome made his promise in good faith, and it was not until five years afterwards that any book of his was published upon Algebra. Tartalea, however, had left

[1] "Vostra eccellentia erra tanto de grosso che me ne stupisco, perche cadanno che hauesse solamente mezzo un' occhio lo potria vedere . . . . . cosa molto redicolosa . . . . . cosa molto lontano dalla verita, della qualcosa molto me ne rincresce per honor nostro. Non altro Iddio da mal, &c. Nicolo Tartalea Brisciano tutto vostro."

Milan, sulky, and already considered that he had a right to quarrel with Cardan. Jerome's next letters were not answered, nor are they published in Tartalea's book.

On the 4th of August, however, Cardan wrote a letter, which is printed, complaining courteously of the fact that he had written many other letters, which were not honoured with any reply, asking for information upon various points, and chiefly requesting help in clearing up the difficulty of the irreducible case $x^3 = bx + c$, at which Jerome had arrived in the course of his own studies. To this letter Tartalea appends the note that follows: "I have a good mind to give no answer to this letter, no more than to the other two. However, I will answer it, if it be but to let him know what I have been told of him. And as I perceive that a suspicion has arisen concerning the difficulty or obstacle in the rule for the case" ($x^3 = bx + c$), "I will try whether he can change the data that he has in hand, so as to remove the said obstacle and alter the rule into some other form; though, indeed, I believe that it cannot be done, nevertheless there can be no harm in trying[1]." He wrote therefore a letter, which began, omitting altogether Honorando, or Honorandis-

[1] Op. cit. p. 126. "Et dapoi che uedo che sta suspettando sopra la retta via de la regola del capitolo di cose, e numero, equal a cubo, uoglio tentare se gli potesse cambiare li dati che ha in mane cioe remover lo di tal via retta e farlo intrare in qualche altra à ben che credo non ui sara mezzo, nondimeno il tentar non noca."

simo, to say nothing of Carissimo, thus:—"Messer Hieronimo, I have received a letter of yours, in which you write that you understand the rule for the case $x^3 = bx + c$; but that when $(\frac{1}{3}b)^3$ exceeds $(\frac{1}{2}c)^2$ you cannot resolve the equation by following the rule, and therefore you request me to give you the solution of this equation $x^3 = 9x + 10$[1]. To which I reply"—(it will be understood that to himself also the case was insoluble)—"to which I reply, and say, that you have not used the good method for resolving such a case; also I say that such your proceeding is entirely false. And as to resolving you the equation you have sent, I must say that I am very sorry that I have given you already so much as I have done, for I have been informed, by a person worthy of faith, that you are about to publish another algebraical work, and that you have gone boasting through Milan of having discovered some new rules in Algebra. But take notice, that if you break your faith with me, I shall certainly not break promise with you (for it is not my custom); nay, even undertake to visit you with more than I had promised."

The rest of the letter, which is very long, was chiefly intended to be disagreeable. To another of Cardan's

[1] In the old algebraical language, "haueti inteso il capitolo de cubo, equale à cose, et numero, ma che quando il cubo della terza parte delle cose eccede il quadrato della mita del numero che all'hora non poteti farli seguir la equatione, et che per tanto me pregati che ue dia resolto questo capitolo de .1. cubo. equale à .9. cose piu .10."

questions, Nicolo replied that two of his pupils had answered it—one of them, Richard Wentworth, the English gentleman, whom he praised much; and he sent the two solutions by his pupils, written with their hands. He further talked about his Euclid, and in various ways heartily abused Cardan's Arithmetic, which he pronounced to be a confused mess, and supposed must have been not got out of his own head, but "collected and copied by the pen from divers books, at divers times, just as they chanced to come into his hands." Upon another mathematical matter he was further "amazed and astounded" at Cardan's persistent ignorance, laughed at his having once said to him in his own house that if a certain kind of solution had not been considered impossible by Luca di Borgo, he should have tried to discover it (as if he could discover anything indeed!), and thought it a pity that he did not know physic enough for the cure of his own errors. He ended by saying, "once I held you in good esteem, but I see now that I deceived myself grossly[1]."

Cardan replied briefly to his friend on the 18th of October, after having perhaps waited until he had cooled from the anger which Tartalea's rude letter must have at

[1] "Et certamente el fu gia che ui haueua in bon conto, ma al presente uedo che me ingannaua de grosso, non altro Iddio ui conserui in Venetia alli .7. Agosto. 1539. Nicolo Tartalea Brisciano." Op. cit. p. 127.

first occasioned. He replied to the "most honourable Messer Nicolo[1]," that he must have been beside himself to write as he had written to one "who was his great friend, and had without envy praised him to the skies." He added, "for the other matter I reply that you have been misinformed about my intention to publish on Algebra, and to make known your rules I think you must have been hearing something from Messer Ottaviano Scoto about the Arcana of Eternity, which you imagine to be the Algebra I am about to publish. As to your repentance at having given me your rules, I am not to be moved by that or by any words of yours to depart from the faith I pledged you[2]."

To this letter Tartalea sent no answer; still Jerome did not quarrel with him; and another letter from Cardan, the last in Nicolo's collection, dated the 5th of January, 1540, stated how "that deuce of a Messer Zuanne da Coi[3]," by whom Nicolo, Jerome, and all mathematicians in that part of Italy were bored, had come to Milan, believing that Cardan was desirous to give up to him his arithmetical lectures, and professing, apparently with truth, that he had found out certain rules. Cardan

[1] "Ho receputa una uostra, Messer Nicolo osseruandissimo, ..."

[2] " . . . Quanto al penitue hauerm dato quel uostro capitolo, per questo non mi mouo, per uostre parole a niuna cosa contra la fede ui promisse."

[3] "Eghe ritornato qui quel diauolo de Messer Zuanne Colle, . . ."

having had some contests with their ancient rival, desired Tartalea to assist in capturing the ground which Zuanne held as his exclusive property. To this letter Nicolo added in his diary a number of saturnine and mathematical comments, and summed up by writing that he should not choose to send Cardan an answer, because he said "I have no more affection for him than for Messer Zuanne, and therefore I shall leave them to themselves[1]."

One of the questions put by the pertinacious Messer Zuanne Tonini da Coi, not soluble at the time by any one, and thought insoluble by some, was the following: "Find me three numbers continually proportional, of which the sum is ten and the product of the second by the first is six." This led to the following troublesome equation: $x^4 + 6x^2 + 36 = 60x$. Cardan worked very industriously at it, and urged his friend and pupil Lodovico Ferrari to do the same. Tartalea, we have seen, declined contemptuously to take the field. An ingenious method of solution was eventually discovered by Ferrari, which consisted in adding to each side of the equation arranged in a certain way quadratic and simple quantities, of a kind calculated to render the extraction of the square root of each possible. By this method of resolving

[1] "Non li voglio dar altra risposta, perche è non ui ho piu affetione à lui che à Messer Zuanne, e pero li voglio lassar far tra loro." Tartalea, p. 122.

an equation of the fourth degree, by the reduction of the biquadratic into a cubic, Ferrari secured for himself the right of being honourably named in every history of mathematics.

Honourably named and little more, for he died young, and left no written works behind him. His friend Cardan, through whom he rose, has left a brief sketch of his life and character[1]. I have already related how, after the introductory omen of a magpie, young Ferrari had been brought by his uncle to Cardan's house as a servant. Some minute detail connected with that event may now be given. A certain Bartholomew Ferrari, a man of humble fortunes, having been exiled from Milan, settled in Bologna, where he had two sons, Vincent and Alexander. Vincent was Lodovico's uncle, Alexander was his father. Alexander being killed, the boy went to his uncle's house, and lived there. Vincent Ferrari had an unmanageable son named Luke, who, flying one day from his father's anger, went to Milan, and by chance hired himself as famulus into the service of Cardan. After a time he slipped away from his new master, without warning given, and went back to his old home. Jerome applied there for him, and his father Vincent took that opportunity of getting Lodovico off his hands. As a substitute for his son Luke he sent his nephew off to be the doctor's servant, and so it happened that on a day

[1] Opera, Tom. ix. p. 568. I take from it the following details.

before mentioned, Lodovico Ferrari, then fifteen years old, went, poor and uninstructed, into Jerome's service. But he was a boy of very extraordinary natural ability; Cardan soon put him to use as an amanuensis, and accepted him next as a pupil and a friend—not indeed because he was a good boy, for he was nothing of the kind. His temper was so bad that Jerome went near him with caution, and shrunk often from the task of speaking to him. He grew up also irreligious, given to habitual and open scorn of God. The friendship between him and Cardan grew out of their common love of knowledge, out of the problems upon which they had worked together, out of Lodovico's sense of obligation to the man by whose hand he was raised, and out of Jerome's pride at having fairly brought before the world so fine an intellect. Ferrari also was a neat and rosy little fellow, wicked as he may have been, with a bland voice, a cheerful face, and an agreeable short nose, attentive in trifling things, and fond of pleasure. By his manners and his brilliant genius he made way for himself in the world with wonderful rapidity. His worldly career presented, in its early course, a great contrast to that of the unlucky philosopher who taught him Latin, Greek, and mathematics, and upon whose shoulders he knew how to rise.

At the age of eighteen Ferrari began to teach, and excited universal admiration in the town. He was

scarcely twenty years old when he contested publicly with Zuanne da Coi and Tartalea: Tartalea declares in his own book that he, Tartalea, was left the victor: Cardan states that Ferrari overcame them both, and appeals confidently, in support of his assertion, to the public records then extant, and the common understanding in the town. Two years afterwards the brilliant young scholar was held in so much esteem, that the possession of his services was contended for by the great men around him. He was tempted by simultaneous offers from the gay Brissac, from the emperor himself, who desired him as a teacher for his son, and from the Cardinal of Mantua. An offer of court service did not lure Ferrari, who cared less for nominal honour than for actual profit. The Cardinal's brother, Ferrando Gonzaga, then governor at Milan, having given to the flourishing youth the office of surveyor of the province, with a salary of four hundred gold crowns; and the cardinal himself offering largely, Lodovico went into the churchman's train, and was so well rewarded, that in eight years he received nearly four thousand gold crowns, in addition to free entertainment for himself, two servants, and a horse. The cardinal's good living after a time aggravated a fistula with which Ferrari became troubled, and unreasonably angry with his patron because he was unable to escape the consequences of his own too free indulgence in the plea-

sures of the table, the ill-humoured young mathematician quitted abruptly his not very dignified position as a retainer. Then retiring into independence, he built for himself a house, in which he went to live with his sister, Maddalena, orphan and widow, whom he truly loved. We shall meet with him hereafter, teaching mathematics at Bologna; but it is expedient to complete the sketch of his career by adding in this place, that he died suddenly and prematurely, at the age of thirty-eight, in the first year of his professorship, as it was said by poison. Nearly all sudden deaths did in those days of ignorance prompt rumours about poison; but in this case there was some colour given to the rumour by the fact that his sister—the one person towards whom his wayward heart had really turned in love—inherited his property, scorned to lament at his funeral, married fifteen days after his death, and at once gave all his money, goods, and chattels, to her husband. That reads like the sequel to a wild story of Italian passion. But the sequel is not there. The sequel is, that Maddalena lived to be repudiated by the man to whom she gave her own soul and her brother's wealth. When Cardan wrote the brief sketch that he has left of the career of his old pupil, she was a miserable old woman, living in the country in a state of abject poverty, unpitied and unaided by the man whom her guilt, as it was suspected, had enriched. Ferrari left no

other fruit of his great genius than the formula which Cardan has referred to him, and in connexion with which his name therefore has remained to us. He wrote no books, and engaged himself during his unhappy life in little other literary labour than the collecting of the dicta left by former authors. He had indeed written some comments upon Cæsar and Vitruvius, and of those his sister's husband took possession, with all other property. He laid them by, as he himself told Cardan, until his son by a first wife was old enough to receive credit for having written them, as he intended them to have then published in his name. In every way the enemy resolved to fatten on Ferrari's substance. That is the story of Ferrari; a story of great powers wasted for the want of guiding energy and principle. He was born on the 2nd of February, 1522, and he died on the 5th of October, in the year 1560.

Cardan, in publishing Ferrari's discovery, attributed it duly to its author; and in that respect he was not less just to Tartalea, though the secret of the latter was made public by a breach of faith which, says Nonius (Nunez), a contemporary Spanish mathematician, made Tartalea so wild, that he was like one who had gone out of his mind. Jerome's breach of faith I shall not justify. It will shortly be seen that there was no palliating circumstance possible in such a case which he was not able to urge to himself fairly; the promise he made was ridicu-

lous, and if the wrong consisted rather in making than in breaking it, Tartalea had not the less cause to complain. Sympathy for Tartalea we cannot indeed feel. The attempt to assert exclusive right to the secret possession of a piece of information, which was the next step in the advancement of a liberal science, the refusal to add it, inscribed with his own name, to the common heap, until he had hoarded it, in hope of some day, when he was at leisure, turning it more largely to his own advantage, could be excused in him only by the fact that he was rudely bred and self-taught, that he was not likely to know better. Any member of a liberal profession who is miserly of knowledge, forfeits the respect of his fraternity. The promise of secrecy which Cardan had no right to make, Tartalea had no right to demand. In respect to three-fourths of the case it was indeed peculiarly absurd; because of the four rules discovered by Tartalea, and communicated to Cardan, he could claim rights of invention over one only, that with which he had turned the tables against Antonio Maria Fior, on the occasion of their contest. The other rule then discovered by him had been known not only to Fior, but even to Scipio Ferreo, at least forty years before Cardan published it; and the other two rules discovered by Tartalea in 1530, had then been for some time known to Zuanne da Coi.

Of the conversations and correspondence between Cardan and Tartalea on this subject we have only, as has been seen, the *ex parte* statement of Tartalea, who gives his own version of the conversations, and does not publish all the letters that passed on the subject. Yet it is evident, even from this hostile account, that Jerome made a promise in good faith, and that Tartalea never seemed to consider that it was sufficiently binding. Tartalea himself proves that Cardan bore gross rudeness very good humouredly, and that though his good faith was doubted and contemned, he did not consider himself entitled to take any advantage of its ungenerous rejection. Tartalea's rule was not put into the Arithmetic, nor was it communicated to the world by Cardan until it had grown, in the good soil of his own mind, out of a seed into a tree. He considered then that it had become so far fairly his own that he was entitled to make public distribution of its fruits, if he gave, as he was quite ready to give, and did give, proper credit to Tartalea for his part in their production. If he was still bound by the letter of his promise, since mathematical facts could be explained only step by step, he, who proved himself to be decidedly the best mathematician of his time, was bound to stand still near the threshold of his science till Tartalea, by moving forward and himself publishing his rule, left the path open for him. Tartalea, however, was in no mood to be hurried, and he actually

died about thirty years after the acquisition of two of his rules, and a quarter of a century after the acquisition of the others, without having either published them or used them—so that it could be known of him that he had done so—as the stepping-stones to higher knowledge. Cardan committed most undoubtedly a breach of faith, and was guilty of an abstract—though not therefore the less real—wrong; practical wrong he did to nobody, for his book on Algebra was a great gain to science, and did no actual injustice to Tartalea, to whom Cardan rendered in it that which was his due. When to the preceding facts we add the reflection that this great algebraic quarrel took place in the most corrupt of European states at one of the corruptest periods of modern history, when the promise of a pope himself was good for nothing, we shall be likely to decide fairly upon the degree in which the details of this controversy should affect our estimate of Cardan's character.

The Book of the Great Art, the Algebra[1], published by Cardan in the year 1545, which was the tenth book of his Arithmetic, was published by Petreius, of Nuremberg, and dedicated to the scholar in that town for whose courtesy he was indebted for his introduction to its presses, Andrew

[1] "De Arte Magnâ, sive de Regulis Algebraicis." It was published in folio, says Naudæus, who appears not to have seen the first edition. I believe it is not in any English public library.

Osiander. To him Jerome dedicated, with a proper sense of gratitude and literary courtesy, his Algebra, as to a man "most learned in Greek, Hebrew, Latin, and Mathematics, but rather," he says, "because it appeared to me that this my work could be dedicated to no man more fitly than to yourself, by whom it may be emended (if my erring hand has ill obeyed the mandates of the mind) and read with enjoyment and understanding, from whom also it can receive authoritative commendation. . . . Accept, therefore, this lasting testimony of my love towards you, and of your kind offices towards me, as well as of your distinguished erudition[1]."

Very genuine in Cardan is the feeling that prompts all his dedications. His books are always inscribed in acknowledgment of kindness to the men who had a claim upon his gratitude, never to men whom he hoped thereby to make grateful and liberal towards himself. They were the scholar's courtesies bestowed where they were due; he never carried them to market.

Cardan stated at the beginning of his Algebra that, as his work chiefly went into new ground, he should "decorate with the names" of the discoverer inventions not his own, and that all matter not ascribed to other men would be his own. The whole book was original, in fact, with the exception of those few rules from which he started,

[1] Ars Magna. Opera, Tom. iv. p. 221.

and of existing rules the demonstrations were all his with exception of four, said to have been left attached to his four elementary rules by Mahomet ben Musa, and two of which Lodovico Ferrari was the author. Cardan, in his first chapter, ascribes to every man his own; does honour to Pisanus and Fra Luca; then, after coupling the discovery of Scipio Ferreo with a high eulogy of the mathematician and his divine art, Jerome adds: "In emulation of him, Nicolo Tartalea of Brescia, our friend, when in contest with the pupil of Ferreus, Antonia Maria Fior, that he might not be conquered, discovered the same rule, which he made known to me besought by many prayers[1]." He is nowhere chary of acknowledgment. In the sixth chapter of this book he ascribes to Tartalea the credit of having taught him in what way to push forward all his algebraical discoveries, owning freely that a hint given by Tartalea led to his use of the method by which all the rules in the work are demonstrated, and all that is new was first discovered. "When I understood," he says, "that the rule taught to me by Nicolo Tartalea had been discovered by him through a geometrical demonstration, I thought to myself—that must be the golden way up to all algebraical discovery[2]." That golden way, there-

[1] Op. Tom. iv. p. 222.

[2] Ibid. p. 235. The details that have here been given are further illustrated by a highly characteristic portrait of himself, prefixed by Tartalea to his "Quesiti et Inventione." A fac-simile of that portrait, reduced in size, will be found upon the title-page of the second volume of the present work.

fore, Cardan prosecuted, and the result was a work of remarkable completeness and originality. In it he laid down rules for all forms and varieties of cubic equations, having all their terms or wanting any of them, and having all possible varieties of signs. Every rule given he demonstrated geometrically. He treated very fully of almost all kinds of transformations of equations, in a manner before wholly unknown. In the same book he for the first time made frequent use of the literal notation, *a*, *b*, *c*, *d*. He therein gave a rule for biquadratics suiting all their cases, and in the invention of that rule made use of an assumed indeterminate quantity, and afterwards found its value by the arbitrary assumption of a relation between the terms. He therein first applied algebra to the resolution of geometrical problems.

The list could be made more minute, but it would in that case be more technical; the citation of those main points is enough to show the very great importance of Cardan's Book of the Great Art, in which the whole doctrine of cubic equations was first published to the world[1]. In that department of algebra, Tartalea had indeed turned the first sod, but it was Cardan who ploughed the field and raised the crop upon it. No algebraical book equal in

[1] In Hutton's Mathematical Dictionary, art. Algebra, there may be seen a list of the chief improvements introduced into the art by Cardan, sixteen in number.

importance to Cardan's was published in his time. The Germans, who were not much read in Italy, had advanced beyond the Italians in mathematics, but Cardan's book published in Germany placed him easily and indisputably at the head of all. One of the best of the German mathematical books, the Arithmetica Integra of Michael Stifelius (Englished, Michael Boot), had issued from the press, also of Nuremberg, less than a year before the publication in that town of Cardan's Ars Magna. Before I close these details in the life of a primitive algebrist, it may help to suggest to us how truly primitive he was, if we consider that in that book by Stifelius the signs $+$, $-$, and $\surd$, were for the first time used.

CHAPTER XIV.

THE CONQUEST OF AN ADVERSE WORLD.

TARTALEA could not get on with algebra for twenty years because he was translating Euclid; Cardan in five years had advanced the science by great strides, and was at the same time engaged upon a dozen other works[1]. In the year 1543 the separate works written by him amounted to the number of fifty-three, divided into a hundred and fifty-eight books, technically so called[2]; and from that date the number of them multiplied so rapidly that an attempt to give even the shortest tolerable account of them all would make this narrative unreasonably long.

A very few more notes will enable us to complete in sufficient detail that essential part of Jerome's life which describes the steps by which he worked his way to fame and general acceptance as an author. After the publication of the Book of the Great Art his way was easy, and

[1] "Neque enim mens tandiu intenta uni negocio esse potest." De Libr. Prop. (1557) p. 13.

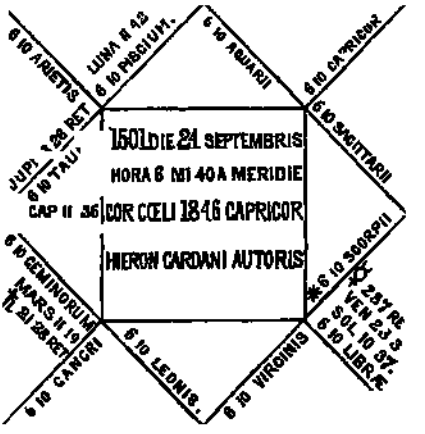
[2] Ibid. The same authority or reference to the subsequent book De Libris Propriis will justify whatever else is said in this chapter upon the order of publication of Cardan's writings.

there were on all sides publishers willing to buy what he would suffer them to print. He was not idle, and his love of print, rather than his love of money, caused him to degenerate often into a hack writer, to drag all manner of disquisitions into his books for the sole purpose of filling sheets; but even such interpolations and digressions —always carefully retouched and digested—having on them his own stamp of eccentricity and genius, very likely helped to make his works more popular. The publications issued by Cardan between the years 1542 and 1545 contributed to the foundations of his fame, and these, which I left out of sight in order to trace uninterruptedly the history of his most valuable treatise, include the last of his less prominent works that will need special mention.

In the first place there was that astrological book which he sent in reply to the application made from Nuremberg by Osiander and Petreius. Joannes Petreius published it in the year 1543, and it was entitled "Two Tracts by Girolamo Cardano, Physician of Milan. One a Supplement to the Almanac, the other on the Restitution of the Celestial Times and Motions. Also Forty-seven Nativities, remarkable for the Events they Foretel, with an Exposition[1]." The book was dedicated gratefully to

[1] "Libelli duo: unus, de Supplemento Almanach. Alter, de Restitutione temporum et motuum cælestium," &c. 4to. Norimb. 1543.

Cardan's Milanese friend and patron, Filippo Archinto. So far as it is a supplement to the almanac, it contains various useful directions, such as how to find the pole, to recognise planets at sight, and so forth, with some useless matter, then accounted precious, of an astrological description The nativities are very curious Among them are the horoscopes—each with an exposition—of Petrarca, of Luther, of the Emperor Charles V, and of King Francis I, of Fazio Cardan, of Jerome himself, of his friend Archinto, and his other patrons; of Venice, from the date of its establishment, and, in the same way, of Florence and Bologna. The horoscope of Jerome himself I append for the benefit of any person who is able to understand such mysterics, or may have a desire to see in what fashion these things were drawn.



Minute explanation of the twelve houses of the twelve signs, and of what Mars meant by being in one, and what the Sun and Venus meant by being together in another, while the Moon was in a third, is rendered the less necessary by the fact that the sketch of his own future, drawn by Cardan from this nativity, was emphatically incorrect. What the stars pronounced strongly against did happen, and what did happen the stars did not indicate at all.

Concerning his skill as an astrologer, Cardan said in his dedication that "the ungrateful condition of the times was such that no prayers or rewards would induce him again to exercise his art." A certain bishop at Rome held, he said, unwittingly, the last example of his skill in it.

Although there was at the time, happily, some tendency to ridicule astrology, still the supporters of that science were not few, nor had its professors, when gain only was their object, any reason to complain, for it was among the wealthy that it found most liberal support; princes and nobles still amused themselves as amateur astrologers, and these were ready to pay liberally for the aid and countenance they had from scientific men. Cardan's way to the favour of the rich at any rate might have been much more difficult had there been less to favour superstition in his character. The practice of astrology Jerome abjured as vainly as the toper might

abjure his tankard. He both practised it again and wrote of it again; twice again in successive works he discussed, among others, his own horoscope. In doing so for the last time, when the events of his life lay chiefly in the past, his comment upon it, and upon all nativities by which it was influenced and modified, became so elaborate that it assumed by itself almost the proportions of a book. He returned then thoroughly to his astrology, for how could he forswear it while he believed the science to be true, and there were yet kings to urge that he would exercise his skill in it on their behalf?

In the same year, 1543, Jerome had begun the writing of a life of Galen, which it does not appear that he ever finished. He also laboured at a book on the art of Metoposcopy, illustrated with numerous physiognomical drawings. He wrote other matter, much that he has himself designated as prodigious folly, on the hint of which he expressed his opinion, and that no foolish one, that there is in the mind, as in the body, a necessity for getting rid of waste,—that the active literary man must write things for the fire as well as for the press. Such a work was Cardan's "Convivium," or treatise on Example in Love. In the same year, stirred by the restless spirit that would never suffer him to be content with one work at a time, he was engaged in philological research, and wrote a dialogue in his own tongue upon a comparison between the respec-

tive qualities of the Greek, Latin, Italian, and Spanish languages. Spanish armies were so much at home in Italy, and the Spanish language is so easily to be acquired by an Italian, that Jerome's busy mind could not have failed to fasten on it, and to add it to all other acquisitions. Still in the same year, 1543, another of Cardan's domestic occupations was the collection into one manuscript volume of his epigrams and poems. His fervid temperament had often, of course, found relief in verse, but Cardan's poems were not in any set form given to the world. One or two are included in his works, and are so directly illustrative of his life, that in their proper place they will become a part of this biography.

In the succeeding year Jerome issued his Five Books on Wisdom[1], from the press of Petreius at Nuremberg, and added in the same volume a revised reissue of the three books on Consolation, and one book on his own written works. In issuing an account of his own works, he professed only to follow the example set by Galen of old, and in his own time by Erasmus. This volume, containing works on three distinct topics, was supplied with an ample index, and dedicated to that

[1] "De Sapientiâ Libri V. quibus omnis humanæ vitæ cursus vivendique ratio explicatur: item de Consolatione Libri tres et Ephemerus sive libellus de Libellis Propriis." Norimb. 1544. This contains the first book De Libris Propriis to which reference has been made in preceding notes, under the title of "De Sapientiâ," &c.

patron whose strength had chiefly been of service in removing for him the obstructions offered to his progress by the Milanese College of Physicians. It was dedicated to Francisco Sfondrato, Senator and (when the book was published) Governor of Sienna, who in the dedication was lauded for the splendour and intellectual refinement of his private life, for his public piety, the innocence and extreme prudence and moderation of his conduct as a magistrate, his lenity, and his simplicity of manners.

In the fourth of the five books on Wisdom there occurs the statement concerning supposed cures of consumption, which was destined to affect the current of his after-life. "When we ourselves long laboured in this city against envy, and our income was not so much as our expenses (so much harder is the condition of a merit that is seen than of one that is unknown, and a prophet is of no honour in his own country), we made many attempts to discover new things in our art, for away from the art no step could be made. At length I thought out the cure of phthisis which they call phthoe, despaired of for ages, and I healed many who now survive." So the physician wrote, believing what he stated to be true.

In the same year, Petreius published Cardan's treatise on the Immortality of Souls, which was republished in the succeeding year at Lyons by Sebastian Gryphius. Out of the first fruits of his industry as Professor of Medicine at

Pavia, were furnished the revised sheets of the first book of the Contradictions of Doctors, published by a Scoto at Venice[1]. These publications caused a continual increase of reputation, and close upon them followed, in the year 1545, as a grand climax, the Book of the Great Art, already discussed. Jerome became from that time forward one of the most popular among the learned authors of his day. A few more publications caused him to be more widely talked about perhaps than any other scholar of the time who did not take part in the great religious movement, or express any of the passions it aroused.

Prosperity had not come to Cardan, but he had brought it to himself; in spite of everything that had warred against him, he had at length achieved as a philosopher his conquest of the world. Dishonoured by his birth, discredited by his first training as a child, frowned upon as a youth by his university, rejected as a man by the physicians of his own town, with an ill-looking and sickly body, an erratic mind and a rough manner, a man to be disliked at first sight, and shrugged at by all that was dull and respectable; in spite of all, by the force of intellect and by the force of incessant, unrelaxing work, he had at last won ample recognition of his merits. He had

[1] This was republished, with the addition of another book, at Paris, by Jacobus Macæus, in 1546; and by Gryphius, at Lyons, two years later. It was then called "Contradictorum Medicorum Libri duo, quorum uterque centum et octo contradictiones continet," &c.

used no worldly tact. His first published book would have been the last book issued by a prudent man, for it put new determination into the antagonism of his opponents. Nevertheless, he had steadily continued at his work, using a strong mind not as a toy but as a tool, and the result ensued which sooner or later must, in such case, always ensue. Man has but to will and work. The objects of a high ambition are not instantly secured. Cardan had not enough tact to create for himself popularity, but he had talent enough to create for himself fame. To create it for himself, laboriously, by endurance and exertion, because no man who moves at a lounging pace is likely to outmarch his neighbours. Jerome had forced his way up through years of discouragement, against contempt and poverty, in spite of severe bodily infirmities, and at the age of forty-four he was at length a recognised physician, occupying a professor's chair, and renowned through Europe as a man of letters. It should be remembered, however, that he had based his reputation on the writing of more works than there were years in his life, and that of those works none had been published until they had been reconsidered, polished, and rewritten more than once, commonly twice, but among his publications there are many passages that had been written five and even ten times by his pen before they were committed to the printer's types. The whole writings of

Cardan, closely printed, constitute as heavy a load as any one man would desire to carry on his back. Very familiar with the pen, therefore, his hand must have become, for to the last he printed nothing that had not been thus written, rewritten, and again, and perhaps yet again and again, revised[1]. "For," said Cardan, "they who write without digestion are like men who eat crude things: for a slight and temporary satisfaction they inflict upon themselves a grave and lasting harm[2]." Even now we have not a right impression of the whole amount of student's work which Cardan's writings represent, for it remains to be added that his memory was very bad, and for the vast store of facts and illustrations in almost every department of the science of his day which his many books contain, he had to depend almost exclusively on written memoranda[3].

This persevering habit of hard work, then, was the root of Cardan's fame, for genius is a sap that will not go far to produce flower and fruit, still less to beget solid timber, if there be not in its due place, hidden from the world's eye, a root like that to keep it fresh and stirring. There were, however, other qualities in Cardan's writings to which we must look for an explanation of the very wide popu-

[1] De Libr. Propr. (1557) p. 74.
[2] De Vitâ Propriâ, cap. l.
[3] "Quantum potui minus memoriæ reliqui quam scriptis."

larity that they obtained in his own day. He was not too much before his time. His intellect was strong and bold; he dared attempt all themes; and there were few of the world's mysteries on which he did not reason in his books; but while his power and originality of mind commanded universal recognition, learned and unlearned were glad to read the works of a philosopher who shared their weaknesses. He was perhaps loved by many not the less for being in certain respects weaker than themselves. On all the attractive and delusive pseudo-sciences of his own day, on ghosts, dreams, portents, palmistry, signs in the heavens and wonders upon earth, Cardan reasoned with good faith, and displayed in their discussion a profundity that flattered and encouraged shallower believers. Then, too, he wrote upon these and all things not only more profoundly, but more pleasantly than the great body of his neighbours. As a writer he was at once learned and amusing. His quick natural wit made him a brisk narrator even when he was most garrulous: there was pith in what he wrote, and his works always sparkled more or less with those well-considered and well-pointed sayings in which learned and unlearned equally delight. Mysteries of heaven and earth thus written about in a credulous and marvel-loving spirit, made the subject of a curious philosophy, would of course yield matter for attractive books. They were not less attractive because they were, or appeared to be, practical

Cardan had always a purpose in his writing. Astrology and kindred topics were supposed nearly to concern the daily interests of life; Arithmetic and Algebra concerned them really. "Make a book," said Cardan, in another of his aphorisms[1]—"make a book that will fulfil a purpose, use will give it polish; then, but not till then, it will be perfect." Probably his popularity was more advanced by qualities of this kind in his writings than by the great and absolute merit of his discoveries in Algebra, whereupon chiefly his fame must rest. The Book of the Great Art must, however, have assured to Cardan among the most learned men of his day that high respect and consideration which could be secured from the more ignorant by works of less essential value.

There is another element in Cardan's writings by which they were characterised from the first, and by which they were made interesting and amusing to their readers, namely, the tendency to become autobiographical, and to perform self-dissection. We should now very fairly turn from a writer who had the bad taste to obtrude himself in his own writings; but three hundred years ago, when modern literature was in its infancy, it had a right to prattle —the right age for talking properly was yet to come. Now the events of Cardan's life, and more especially those of his

[1] The aphorisms cited in this chapter, with one exception, are all from the fiftieth chapter of the book De Vitâ Propriâ.

later years, were of a kind calculated to excite men's sympathies, so that the fragments of self-revelation had always a life and charm in them; they were a pleasant sauce that heightened very much the relish of the reader for the entire book.

Another source of Cardan's popularity was a deficiency of liveliness in other learned writers. There were many isolated pleasant books, but there was no grave utterer of tome upon tome of Latin who had much more than his wisdom to dispose of. The readers of Cardan were sure to be amused with wit and eccentricity, at the same time that they were impressed with the conviction of his being the most learned man of his own time, for there was no other whose philosophy embraced so wide a range of subjects. In this respect, and in the charm of nimbleness and suppleness as a writer, his chief rival, Scaliger, was greatly his inferior.

In the year 1545, then, at which date this narrative now stands, Cardan lectured on medicine in the University of Pavia as he had lectured during the previous year, almost to empty benches. The confusion caused by war in the finances of the university did not check very seriously his career, and the position attained by him was at length a safe one. As a physician of much more than common penetration he was widely sought, and as an author, the series of works ending with his real master-

piece, the Book of the Great Art, had at last won for him an extensive reputation, Europe being then one republic of letters, which was addressed by every man who published books in Latin. The political boundaries of states then circumscribed no man's literary credit, and authors seeking publishers looked about Europe, not about their own town only. So the works of Cardan and of many another learned man were first issued, now from a press in his own country, now by a German publisher, and at another time perhaps in Basle or Paris. It was, as we all know, no mere spirit of pedantry that first prompted the use of Latin as an universal language.

We ought not to turn from these considerations of the source of the fame earned by Jerome among those of his own day without one or two comments, that may save him, and his age also, from too hasty contempt. There are superstitions current among ourselves. Credulity is now in some respects as gross, though not as common, as it was during the sixteenth century. If we have made what we believe to be astounding strides in knowledge, let it be borne in mind that the men of that age moved forward not less rapidly than we are moving now, in spite of the great mixture of error with their wisdom which appears so strange to us wherever it is obsolete. The political movements of rulers, the devastation of lands, the demoralisation and impoverishment of the people, were then

indeed deplorable, and we excel that period in wisdom by the sum of all experience that has been since acquired. Yet we should know that it was then possible to boast not less loudly or less justly than we now boast in our day of railways and electric telegraphs, and to believe that intellect had few more triumphs to achieve. "We should exult[1]," said Cardan, writing in this vein—"we should exult in a field covered with blossom. For what is more wonderful than pyrotechny or the thunderbolt aimed by the hands of mortals, which is more devastating than the thunder of celestial beings? Nor will I be silent concerning thee, great magnet, by whom we are led through the vastest seas in the darkness of night, through fearful storms, into strange, unknown regions. Add also the invention of typography, achieved by mortal handicraft and heavenly wit, rival to the divine miracles, and what more is there to be done unless we occupy the heavens?"

Again we should remember, if we would do justice not to his age only, but also to Jerome himself, that the strange combination in one character of high intellectual endowment with superstitions of incredible absurdity—the kind of mixture we have noticed in Cardan—was common among the foremost men of all that time. Kepler himself, like Cardan, cast nativities; Tycho Brahe kept an idiot, whose mouthings he received as revelations from

[1] De Vitâ Propriâ, cap. xlv.

on high; Melancthon was an interpreter of dreams; and Luther, who abounded in many superstitions of his day, had so certain a belief in killcrops, or devil's changelings, that having seen a boy at Dessau whom he took for a changeling, he did not scruple to advise his murder. "I told the Prince of Anhalt, that if I were prince of that country, I would venture homicidium thereon, and would throw it into the river Moldau[1]."

The self-revelations of Cardan may furnish us with a more vivid picture of such inconsistencies than could be had from others using the subdued tone common among men in intercourse with one another. I do not, however, think that he was in such matters a greater curiosity than many of the learned men about him. His eccentricity consisted perhaps more in the extent of his candour than in his peculiarities of conduct or opinion.

It is not, for example, every writer who is ready to amuse his readers with a chapter upon what he likes to have for breakfast or for supper, and how long he likes to be in bed. When he was old and garrulous, Cardan poured out a rich store of such details, which now serve pleasantly not only in aid of a minute depiction of himself, but also in illustration of the manners of his time[2].

[1] For these hints I am indebted to Dugald Stewart's preliminary article in the Encyclopædia Britannica.

[2] Authority for all the succeeding details upon food and dress will be found in chaps. vi. viii. and xx. of the book De Vitâ Propriâ.

Cardan had a constitution that required to be refreshed with a full measure of sleep. He avoided night-watchings as much as possible; he liked to spend ten hours in bed, during eight of which he slept if his health happened to be pretty good, otherwise he had not more than four or five hours of proper rest. When he was wakeful he was accustomed to get up and walk round his bed counting thousands, with the hope of making himself sleepy. He took but little medicine, being a doctor; but when his sleeplessness grew to be troublesome he abstained very much from food, or put himself upon half diet. The medicinal remedies most used by him to procure sleep were bear's grease, or an ointment of poplar, applied externally in seventeen places. It is an edifying thing for us to figure to ourselves one of the most eminent physicians of the sixteenth century rising at night weary of watching to grope for his little jar of bear's grease, and then patiently sitting down on the edge of the bed to anoint the top of his head and the soles of his feet, his elbows, his heels, his thighs, his temples, his jugulars, the regions of his heart and liver, and his upper lip, according to the formula prescribed, then creeping into bed again to try the value of his remedy.

Two hours after the sun Jerome rose for the day. He was not much troubled with the putting on of clothes, for he was careless about the purchasing of new dress; during

the days of which the story has been thus far told, careless upon compulsion. His private opinion was that four garments ought to suffice for a man, one heavy and one heavier, one light and one lighter. With those he could make fourteen respectable combinations of attire, not counting one that consisted in the wearing of them all at once. He did not quite act up to that theory, but he had not a predilection for new clothes, and was commonly to be found wearing dress of a past fashion, or when he became more of a traveller, wearing out in one country clothes bought in another. Thus, for example, after his return from the Scotch journey, presently to be related, he caused remark among his neighbours by continuing to wear the dress that he had bought in Edinburgh, Edinburgh fashions being foolish in the eyes of Pavia, Milan, and Bologna.

Cardan liked a heavy supper and a light breakfast, supper being his chief meal during the day. The light breakfast consisted in his mature and later life of bread, water, and raisins, tea and coffee being in those days unknown. To his wife and children he was attached very warmly, though Aldo, his youngest son, proved a young scapegrace, and began early to trouble him. His eldest boy, Gian Batista, was good and amiable; trained by Cardan to his own profession, he was simple-minded and of quiet ways; Clara, the daughter too, was a good

girl; and we may suppose that wife and children were not shut out of the philosopher's study. There he worked with his feet naked, dipping his pen into a costly inkstand, and not unwilling to befid his sickly face sometimes over one of the pet animals, whether it were cat, dog, goat, or bird, that was allowed to scratch or hop among his papers. Then he had patients to see, and his lecture to deliver. When his dinner came it was a light one. It was never less, however, than the yolk of an egg, with two or more ounces of bread, and with or without a modicum of wine. On Friday or Sunday he had shell-fish, of which he was very fond. There was no solid food—not counting fish as solids—that he liked better than veal, and the way to cook veal to his utmost satisfaction was to stew it in a pot without liquor, after it had been well beaten with the backs of knives. It was then, he considered, moister and richer than meat roasted on a spit. After dinner Cardan liked a little music.

Supper—tea being of course an unknown meal—was the great gastronomic event of Cardan's day. There was always a dish of beet, or else rice with a salad; but he preferred endive. Fish, he tells us, he liked much better than meat; but then it must needs be good and fresh. Fond too of angling, he was glad when he had fish of his own catching. Of all fish he preferred fresh-water shell-fish, and of those above all others river mussels, because,

we are told, his mother longed for them before he came into the world; but he had a great partiality for oysters too, and cockles. He is particular to specify his regard for codfish, halibut, and sturgeon, for turbot, mullet, gudgeon, soles, flounders, and others; also for pike and carp; also for land tortoises. He liked tunny in all states; and herrings, whether salt or fresh, but best of all when dried. After all he is not sure whether the best of all eatables is not a well-selected carp, weighing from three to seven pounds. From large fishes he lets us know that he removed the head and belly, but from small fishes only the backbone and tail.

Of flesh meats he preferred veal and pork, roasted or minced. He was particularly fond of chickens' wings, and of the livers of capons and pigeons, and of giblets generally.

He had a partiality for sweets; and records his power of appreciating the delights of honey, of ripe grapes, of melons, figs, cherries, peaches, and the like; he is at the same time particular in stating that none of these things disagreed with him. In oil he delighted beyond measure, whether mixed with salt or with sweet olives. Onions always did him good; and he found rue also of great virtue in preserving him from poisonous influences of all kinds. He derived benefit, also, from the use of Roman wormwood. He allowed himself at supper about half a pint

of sweet wine, to which he put an equal, or rather more than an equal, quantity of water.

Having in his old age told the world these things, Jerome amused himself with the manufacture of a little burlesque sketch of the philosophy of victuals, which may be taken as a satire upon some of his own graver generalisations. "There are," he says, "seven summa genera of things—air, sleep, exercise, food, drink, medicine, preservatives. And there are fifteen species—air, sleep, exercise, bread, meat, milk, eggs, fish, oil, salt, water, figs, rue, grapes, and onions. There are fifteen preparatives—fire, ashes, the bath, water, pot, fryingpan, spit, gridiron, knife-back and knife-edge, a grater; parsley, rosemary, and laurel." Here, it may be observed, the list, made up at random, wants one article more. "Of exercises, there are the grinding-wheel, walking, riding, the small pestle and mortar, cart, making of cutlery, riding (this item is repeated), the saddle, navigation, cleaning of platters, friction or lotion; fifteen," adds Jerome, suddenly counting them up, though they are but a ragged ten, into conformity with his abstruse system of fifteens. "These things," he adds, writing no doubt after supper, with a twinkle in his eye, "I have reduced to a compendium, after the manner of the theologians, not without exercise of profound thought, and a great display

of reason. There are five things," he goes on to say, "that may be taken freely by all except old men; they are, bread, fish, cheese, wine, and water. Two may be used as medicines, mastix and coriander; sugar is used in many things. Two things are condiments, saffron and salt, which also is an element. Four things are to be taken moderately; they are, meat, yolk of egg, raisins, and oil: the last," he adds, "a latent element, answering in properties, when burnt, to the element of the stars!"

So, considering Cardan as an animal, the day, with its edifications, passed away, and there returned with night the period of sleep and dreams. By dreams, as we have seen already, the philosopher considered himself to be sometimes lifted out of animal existence, and brought into communication with things spiritual. His nights were as eventful as his days. He was beset by portents. He saw one evening a meteor which approached his court-yard, and, bright for a minute or two, was extinguished suddenly. That, we are told, preceded his acquisition of the favour of the Marquis d'Avalos, a profitable honour that was not of long duration. He dreamt one night[1] a strange dream of Alexander the Great, Hephæstion, and a lion, that preceded and portended his admission into the Milanese College of Physicians. Alexander

[1] The dreams here quoted are related in the fourth book Synesiorum Somniorum (ed. Bas. 1562), pp. 252, 267.

was d'Avalos or the Cardinal Sfondrato, the lion was the college, and Hephæstion was Luca della Croce. Ghosts of the dead came to the bedside of the excitable and nervous man.* In 1537, a° year after her death, his mother stood at the foot of his bed in the scarlet dress she used to wear when occupied in household avocations. She came to call him to her. Did she not know that she was dead? he asked. She did, and summoned him to come to her next year. But he had work to do, and did not wish to leave it. An accident, a narrow escape from serious hurt or death, in the succeeding year, was the fulfilment of that warning. There was an old college friend, also, who has been named on a former page, Prosper Marinon, a friend who had died in the flower of years, and with whom Jerome had formerly discoursed of ghostly things, and of the state of the soul after death. Prosper Marinon had come to his bedside, also a year after death, and he too being asked, had said that he knew himself to be dead, and had stooped down over his old friend, and kissed him on the lips. A second time, later in Cardan's life, the ghost of Prosper Marinon visited at night his old companion.

Such visions were a portion of his bodily infirmity. His flesh was tainted from the first with evil humours, and the gout, which appeared soon after he removed to Pavia, was no more than a link in a long chain of maladies produced at one time by the irritable state of his nervous system,

and at another time by the impure condition of his blood. But it is just to balance these considerations of his weakness with a few more suggestions of his strength. By the help of a few aphorisms taken from his works, this can be done very briefly. The first two of the following ideas I quote, not for their truth—they wrong humanity—but because they are at once clever and characteristic of the morbid feelings out of which they sprung; the rest are wisely thought as well as shrewdly uttered:

"To a man saying, 'I pity you,' I replied, 'You have no right to do so.'

I told a youth whom I was warning against evil company, 'I can show you many an apple that has become rotten through lying with others in a heap, but I can show you no heap that has made a rotten apple sound again.'

I said to a servant from whom I parted, 'You please me, but I don't please you; therefore I am obliged to leave you.'

Better omit a hundred things that should be said, than say one thing that ought to be omitted.

If you were without money, children, friends, and had the other gifts of life, you could be happy. Wanting those, and these also, there would remain to you few days for sorrow.

The vulgar admire knowledge that comes of experi-

ence; the knowledge valued by the learned is that which is obtained by reasoning from the effect up to the cause.

When you mean to wash, first see that you have a towel handy."

Jerome tells us that the occupations in his study served to moderate the great sense of his love for wife and children. We have now traced his career to the conclusion of that long period of struggle with adversity which Lucia had shared with him. She was not to take part in his prosperity. The white-robed maiden who had tempted him to marriage had been a true wife to him for sixteen years. She had left a home in which there was no want, to starve with him in Milan, to struggle with him in Gallarate, to bear with him the scoffs of neighbours, to sustain his spirit in a thousand hours of sorrow. She must have shed her woman's tears over the loss of those jewels and those bits of bridal finery that had paid gambling debts, or been converted into bread. But she had not been weak. She was brave, says her husband, and of indomitable spirit; gentle, affectionate, and rather good-looking[1]. While Jerome laboured with his pen, she had spent anxious days in meditations upon dinner, and in the rearing of her children, when adversity hung as a heavy cloud over the house. But with the cloud she also was

[1] Geniturarum Exemplar (ed. Lugd. 1555), p. 113.

to fade away; she did not live to see her husband's utmost hope of fame accomplished. She lived out the long struggle, and (perhaps worn down by the succession of anxieties), just when the years of triumph were at hand, the young wife died. Married in girlhood, she could have been scarcely more than thirty-three years old when Cardan lost her tender ministrations.

Jerome had gone to Pavia with his wife, where, in spite of deserted lecture-rooms, and the great loss of income suffered in war times by the university, he did on the whole maintain his position; but to Lucia the change seemed no success. In the second year of office money was deficient, and in the year 1546, there being no funds at all in the hands of the senate, public salaries could only be regarded as bad debts. The house which had belonged to his mother, and which had fallen down, having in the mean time been rebuilt, Jerome returned with his family to Milan. In the next year the difficulty was removed; that year, however, the failing Lucia did not live to see.

The return to Milan caused a year of forced leisure and care. Cardan had to rely mainly on his pen, and spent six months in writing without intermission. It was then that he amused his anxious mind by writing his Encomium on Gout, to whom he was just pledged as a subject; thereto incited, perhaps, by the authority of

Lucian, among whose works there is a dramatic tribute to the might of the same despot, and throughout Cardan's works it is evident that he read Lucian and liked him. At the same time Jerome wrote also an Encomium of Nero; these works being exercises less of satire than of ingenuity. It was an old scholastic manner of amusement to heap up in an uncompromising way all possible arguments in favour of some obvious paradox. So earnestly did Jerome set to work, that we might be misled by his writing into the belief that he did really take Nero for a great and good man, if we did not know that not a doubt had then been cast on the good faith of those by whom he was originally painted as a monster. In the sixteenth century it would have been almost heretical to separate from Nero seriously the ideas of cruelty and wickedness. That Cardan chose Nero for his white-washing because he was the blackest man of whom he knew, is evident upon referring to another of his works that contained the set of horoscopes recently mentioned. Among them is the horoscope of Nero, properly adapted to a character of superhuman wickedness.

So Jerome was occupied, he being then forty-five years old, when, towards the close of the year 1546, his young wife died[1]. He was left in charge of his three motherless children, of whom the eldest, Gianbatista,

[1] De Morte. Opera, Tom. I. p. 676.

was thirteen years old; the girl Clara was eleven; and Aldo, the younger boy, was four. Delicate charge for a busy and eccentric student! Cardan's own mother was dead; but there remained to the children still their grandmother Bandarini, the Thaddæa before mentioned, who, when her daughter died, had survived by fifteen years her husband Aldobello. She, while she lived, occupied imperfectly the mother's place in Jerome's household[1].

Had Lucia lived on, how different the future might have been! The terrible calamity that cannot be averted now, might then never have crushed her husband's heart. They might have taken delight together in the great fame of the philosopher, with which during his own lifetime all Europe was to ring, and while the note of triumph was resounding out of doors, there might have been other voices murmuring about the walls of home than the dull echoes of the mourning of a very desolate old man.

[1] De Vitâ Propriâ, cap. xxvii. p. 99.

END OF VOL. I.

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